Connecting conditionals: a corpus-based approach to conditional constructions in Dutch

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CHAPTER 2

Semantics and pragmatics of conditionals

2.1 Introduction

As we saw at the start of the previous chapter, conditionals enable us to reason and argue about possible states of the world, and they have received attention within several academic disciplines (for references, see chapter 1). Within linguistics, the field in which this study is carried out, researchers have been concerned with both the form and function of conditionals in natural language. Logical analyses traditionally describe the meaning of conditionals in truth-conditional terms by roughly equating 'if p, (then) q' ($p \rightarrow q$) with material implication in logic ($p \supset q$), whereas usage-based analyses often swiftly dismiss such an approach because of mismatches between the conjunction *if* in natural language and its equivalent operator in logic.

The aim of this chapter is to provide an account of conditionals in natural language which does justice to both the rich tradition of logical analyses of conditionals as material implication, and the grammatical and pragmatic analysis of conditionals as conjunctions and constructions in language use. One might think it strange that such widely diverging perspectives on one phenomenon exist, even within a single academic field, but I will use the differences in these approaches to provide a clear picture of the topic of this dissertation: conditionals in natural language. This chapter provides the background to the main question of this study: How are conditionals used in natural language? Of course, one cannot expect such a general and, as we will see in this chapter, heavily debated question to be answered in full. Therefore, the function of this chapter is not only to provide an overview of the literature on the subject

at hand, but also to use the insights from the literature to narrow down the question above, and to provide the necessary terminology and definitions for analysing conditionals in natural language.

Before discussing any analyses of conditionals, I deem it necessary to properly introduce conditionals as the object of this study, and to describe their characteristics in section 2.2. In section 2.3, I will present an overview of truth-conditional analyses of conditionals, and I will discuss in some detail the discrepancies between the (narrowly defined) truth-conditional meaning of conditionals, and the (more broadly defined) meaning and use of conditionals in natural language. Next, in section 2.4, the analysis of non-truth-conditional meaning or *pragmatics* of conditionals is introduced.[1] I then take the two main discrepancies mentioned above as a starting point for a detailed analysis of the 'unassertiveness' and 'connectedness' of conditionals in sections 2.5 and 2.6 respectively. As announced in chapter 1, this culminates in more narrowly defined research questions, which are presented in section 2.7, and will guide us through the rest of this dissertation. Finally, in section 2.8, I will present the conclusion to this chapter.

2.2 Conditionals in natural language

2.2.1 Introduction

Conditionals in natural language typically consist of a subordinate *if*-clause functioning as the antecedent, and a main clause functioning as the consequent, as in the example in (1) below.[2]

(1) If I catch the train, I will come on time. (Dancygier & Mioduszewska, 1984, p. 122)

In this example, the complex sentence consists of two clauses, the antecedent and consequent respectively, which both express a proposition, which will be referred to as p and q respectively.[3] To be clear on terms from the start, I will use the term 'sentence' as referring to a linguistic object composed of words. The

[1] Of course, viewing non-truth-conditional meaning as 'pragmatics' is a choice in itself. This point will be discussed in section 2.4 as well.

[2] Different terms for *antecedent* and *consequent* are used in the literature on conditionals. This is partly because of theoretical differences, but the terms are also used interchangeably. Here the term *antecedent* is used for the subordinate *if*-clause of a conditional sentence, also called *protasis*. The term *consequent* is used for the main clause, also called *apodosis*. The main benefit of not using *if*-clause and main clause is that the terms antecedent and consequent can also be applied to less canonical constructions.

[3] Different disciplines and traditions have different ways of referring to the propositions presented in conditionals. Generally, A and C are used to refer to the antecedent and consequent of the linguistic expression of the conditional, while p and q, P and Q, and sometimes A and B are used to refer to the individual propositions. For the interested reader, I note here that the use of P and Q (and R) for propositions is attributed to Russell in *The Principles of Mathematics* (1903, p. 3), although they can also be found in Boole's earlier *An Investigation of The Laws of Thought on Which are Founded the Mathematical Theories of Logic and*

term 'proposition' is used for what a sentence expresses and what can be evaluated in terms of truth conditions, resulting in a truth value (i.e., $\top$ or *true*, and $\bot$ or *false*). When a sentence is actually spoken or written in a communicative context (for a more elaborate discussion of using language as 'joint actions,' see Clark, 1996, Chapter 1), I will use the term 'utterance'. Returning to conditionals, the literature shows a considerable number of accounts concerned with different types of connections between antecedents and consequents. The connection between p ('I catch the train') and q ('I will come on time') in (1) is, in Dancygier and Mioduszewska's terms, consequential: catching the train is presented as the cause of arriving on time (cf. Dancygier & Mioduszewska, 1984, p. 122).[4] Although this connection may seem straightforward at first, it is at the heart of a long-lasting discussion concerning the analysis of the natural language conjunction *if* ('If p, (then) q') in terms of the logical operator of implication ($p \rightarrow q$).

Defining what exactly constitutes a conditional in natural language is 'extremely difficult, if not impossible' (Declerck & Reed, 2001, p. 8). According to Haiman (1978, p. 564), 'neither linguists nor philosophers have suggested a coherent explication for ordinary-language conditionals'. Gazdar (1979, p. 83) addresses a number of 'sticky issues surrounding natural language conditionals' and Levinson (2000, p. 208) remarks that 'unfortunately [...], a good semantic analysis of conditionals still eludes us'. Wierzbicka (1997, p. 18) argues that most literature on conditionals does not identify what conditionals actually are. From this, it may seem that defining the object of this study is indeed impossible. However, as Feger (2001, p. 1968) remarks, sometimes there is no 'well-defined population of objects [...] and a preliminary selection has to be made intuitively'. Before resorting to such intuitions, however, I find it worthwhile to discuss suggestions and definitions offered in the literature available.

The aim of the current section is to describe the characteristics of conditionals in natural language, as a way of characterising the object of this study. I will do this by first discussing the use of conditionals in terms of their function in natural language in section 2.2.2. Next, I will discuss the use of conditionals in terms of their form in natural language in section 2.2.3. Based on insights from these two complementary perspectives, I will formulate characteristics of conditionals in section 2.2.4, and in section 2.2.5 I will offer a brief conclusion before moving on to the truth-conditional meaning of conditionals in section 2.3.

Probabilities (1854, p. 148). Indeed, the classifications prior to or around the publication of Russell's work discussed in section 3.2, do not use P and Q for the propositions. (Sometimes, X and Y are used.) This might, however, also reflect their focus on grammar instead of logic. Following common practice in recent linguistic literature on conditionals, p is used here to refer to the proposition in the antecedent and q to refer to the proposition in the consequent.

[4] One could argue for a connection in terms of enablement instead of causality here, as a somewhat weaker form of causality seems to be expressed. See also section 3.3.7.

2.2.2 Functions of conditionals

Two different perspectives are helpful in trying to provide a clear picture of conditionals, although they are, in practice, not easily separated. The first perspective is the semasiological approach (see e.g., Geeraerts, 2017, p. 161), in which we start out with addressing the concept of conditionality by focusing on the default form of conditionals and asking the question 'what does *if* mean?'.[5] The second perspective is the onomasiological approach, in which the perspective is to answer the question 'how is conditionality expressed?'. We will start in this section by addressing the first question, and the second question will be addressed in section 2.2.3.

Elliott (1981, p. 4) defines a conditional as 'a two-clause sentence in which the first clause states a supposition or hypothesis and the second clause states the results if that condition is met'. He follows Smyth (1920, p. 512) in arguing that the subordinate clause expresses a supposed or assumed case from which, if accepted, the conclusion in the main clause follows. In suppositional theories of conditionals, 'the basic concept required for the interpretation of *if*-sentences is that of supposing [...]. To assert 'If p, q' is to assert q within the scope of the supposition that p' (Mackie, 1972, pp. 92–93; for a recent suppositional account, see Carter, 2021). Rescher (2007, p. 2) argues conditionals to be 'statement-connective statements [of which] the consequent [...] spells out what follows from the acceptance or supposition of the antecedent'. Rescher extends the structure of conditionals to bi-partite sentences (i.e., not necessarily bi-clausal) in which the acceptance of the antecedent leads to what is expressed in the consequent. This resembles the characterisation of conditionals by Nieuwint (1992, p. 178), who defines the use of a conditional as a 'contingent commitment to q, which becomes operative as soon as p materialises'. Similarly, Quirk et al. (1985, pp. 991, 1089) characterise conditionals as sentences in which the situation in the main clause is 'consequent on the fulfilment of the condition expressed in the subordinate clause'.

Funk (1985, p. 369) characterises conditional sentences as 'those complex sentences expressing a conditional relation which consist of at least two, usually finite, clauses one of which describes a conditioning event [...] while the other [...] describes an event whose assertion is shown as depending on the truth of the conditioning event'. In a similar fashion, van der Auwera (1986, p. 200) puts forward the 'Sufficiency Hypothesis' in which 'p is a sufficient condition for q'. Stalnaker (1968, pp. 101–102), following Ramsey (1950, p. 248), describes a conditional as a device for adding an antecedent to 'your stock of beliefs,' adjusting conflicting beliefs and evaluating the conditional depending on the truth of proposition q expressed in the consequent. Although the framework differs, Sweetser's (1990, p. 127) description adheres to this view

[5] Note that, for now, the term 'function' is used rather than *meaning*, as the latter would already have implications for further analysis. Also note that 'function' is not used here to denote the various speech acts (cf. Austin, 1962; Searle, 1979) that may be performed using conditionals.

of a conditional clause as 'the introduction to a hypothetical world'. Palmer (1986, p. 189) characterises conditionals as 'sentences [that] are unlike all others in that both the subordinate clause (the protasis) and the main clause (the apodosis) are non-factual'. In Palmer's (1986, p. 189) account, a conditional sentence 'merely indicates the dependence of the truth of one proposition upon the truth of another'. This connects to Schiffrin's (1992, pp. 165–166) remark that 'there is a widespread belief that these two general semantic properties – non-factuality and event dependency – hold for all conditionals, despite many specific differences among them'.[6]

The different uses of the conjunction *if* mentioned above point to less central cases, described as follows by Huddleston and Pullum (2002, p. 741): 'it must be borne in mind that the general term "conditional" is assigned to the *if* construction on the basis of its characteristic use and that there are some less central uses of *if* that do not impose conditions in the everyday sense of that term'. An example of such 'less central uses' is Austin's 'speech-act conditional' in (2) below.

(2) There are biscuits on the sideboard if you want them. (Austin, 1970, p. 212)

It can be seen why, from a formal point of view, such 'pragmatic conditionals' are of less interest, because they 'do not state in any sense conditions under which the consequent is true, rather they seem to somehow operate on a higher speech act level' (von Fintel, 2011, p. 1517).[7] The inclusion of certain uses of *if*-clauses is dependent on the theoretical framework one starts from, and, consequently, the goals of the analysis. This can explicitly be seen in Mauck and Portner's (2006) review of Declerck and Reed's (2001) typology of conditionals (see also section 3.3). Mauck and Portner (2006, p. 1334) remark that pragmatic conditionals such as the example in (2) 'seem to be conditional in form – in the sense of having a two-clause structure with the subordinate clause introduced by if – but do not have what would typically be considered a conditional meaning. We are unsure whether they should be included in a formal analysis of conditionals'. Accordingly, von Fintel (2011, p. 1517) presents an overview of formal analyses of conditionals and remarks that the pragmatic type 'often gets short shrift (as it will here [...])'. Sanford (1989, p. 5) remarks that 'non-declarative examples such as these are commonly neglected by theoretical treatments of conditionals, and I shall continue this tradition of negligence'. In this study, however, I do treat these cases as conditionals, because their form is similar to 'regular' conditionals and thus may be analysed as part of the same constructional network, i.e., 'a family of closely related senses' (Goldberg, 1995, p. 31). The perspective taken here is that, like the central cases of conditionals in the approaches mentioned above, constructions similar in form similarly express what may be termed provisionally 'a relation of contingency' between

[6] See sections 2.5 and 2.6 for detailed analyses of these properties.

[7] This is not to say that they are of *no* interest in formal analyses. See, for instance, DeRose and Grandy (1999), Siegel (2006), Predelli (2009), referred to by von Fintel (2011).

antecedent and consequent (cf. Prasad et al., 2017, p. 29). In more syntactic terms, following Haegeman (2003, p. 318), both *if*-clauses inside and outside the matrix domain (i.e., relating to event structure or discourse structure respectively), resulting in *event* (or *causal*, *consequential*) *conditionals* and *premise conditionals* (such as *pragmatic conditionals*) are treated as conditionals.[8]

Moving on to another perspective, Kratzer (2012, p. 106) offers a different analysis of conditionals and declares the traditional analysis of conditionals in terms of implication in logic, which is the subject of section 2.3, as 'the story of a syntactic mistake'. She argues that *if*-clauses are devices for restricting the domains of operators and she expands Lewis's (1973b) 'restrictor analysis' of counterfactuals (see section 2.5.4) to (indicative) conditionals. Her view is that 'the job of *if*-clauses in modalised conditionals is simple: they restrict the modal base of the associated modal in the matrix clause,' as her characterisation in (3) shows.

(3) (*If* ... ...), (*necessarily* ... ...)
(*If* ... ...), (*possibly* ... ...)
(*If* ... ...), (*probably* ... ...) (Kratzer, 2012, p. 64)

In Kratzer's (2012, p. 105) account, consequents of conditionals without explicit modals are 'implicitly modalised'.[9]

A risk tied to the semasiological perspective on conditionality is that it may include uses of *if*-clauses that do not express a condition in any sense. We need to exclude known 'non-conditional' uses of *if*, most notably those exemplified by Declerck and Reed (2001), presented in (4) and (5) below.

(4) He works *as if* his life depended on it. (Declerck & Reed, 2001, p. 9)

(5) I don't know *if* he really did it on purpose.(Declerck & Reed, 2001, p. 9)

In (4), *if* does not introduce a condition, but is part of the larger conjunction *as if* introducing a comparison, and in (5) *if* is the equivalent of *whether*. As I will focus on Dutch conditionals from chapter 4 onwards, the language-specific cases of non-conditional use of the conjunction *als* 'if', such as in the example in (6) below, will be discussed in detail in the chapter mentioned.

(6) En hoe hoe is uh Aurea *als* collega? (fn006712)
And how is Aurea as *a colleague?*

In contrast to the attempts at capturing the concept of conditionals discussed above, Wierzbicka (1997, p. 18) argues that 'the concept of IF [...] cannot be meaningfully defined in terms of any other concepts'.[10] Comrie's (1986, p. 96)

[8]For more analyses of 'biscuit conditionals,' see e.g., Bach and Harnish (1979), van der Auwera (1986), Iatridou (1991, Chapter 2), Siegel (2006), Ebert, Endriss and Hinterwimmer (2008).

[9]For a recent discussion of views on *if*-clauses as restrictors of either overt or covert epistemic modals in the main clause, see e.g., Rothschild (2021), Ciardelli (2021).

[10]Notice here Wierzbicka (1997, p. 18) uses capitals in 'IF' here to refer not to the lexical item *if*, but to 'concept' or 'conceptual primitive' and (even) to a 'lexical universal'.

definition of conditionals as the combination of 'material implication with the relevance of a causal relation from the protasis to the apodosis' introduces (implied) causality, which is not tenable according to Wierzbicka. In Wierzbicka's example in (7) for instance, this implied causality is present, while it is not in (8). After all, the latter example cannot be interpreted as the speaker suggesting she forgives him *as a result of* the insulting.[11]

(7) If it rains, I will stay at home. [...] (Wierzbicka, 1997, p. 19)

(8) If he insults me, I will forgive him. (Wierzbicka, 1997, p. 20)

Another example Wierzbicka (1997) provides of problems attached to existing definitions of conditionality is Braine's (1978, p. 2) characterisation of conditionals as statements 'of the form *if* p *then* q [that] invite the inference *if* q *then* p or *if not* p *then not* q'.[12] Wierzbicka (1997, pp. 17, 51–52) criticises this characterisation for being inherently circular, because the concept of 'inference' itself rests on the concept of *if* and she argues for *IF* as a 'conceptual primitive'. As such, she argues, the concept of conditionality is on par with concepts like *not*, *know* and *think*, which can only be clarified by means of examples or 'canonical sentences,' but cannot be properly defined in other terms. Accounts such as Johnson-Laird's (1986), in which *if* is characterised as 'a cue to consider a possible or hypothetical state of affairs,' are criticised by Wierzbicka (1997, p. 17) because using a term like *hypothetical* does not explain *if*, as it is semantically more complex.

Although Wierzbicka's arguments point to a circularity in defining conditionality in terms of inference, hypotheticality or contingency, I will use the discussed accounts in order to arrive at a provisional understanding of conditionals. For now, it will therefore suffice to characterise the function of the conditional conjunction *if* as combining two clauses which present propositions p and q into one complex sentence in which the latter is in some sense contingent on the former.[13]

2.2.3 Forms of conditionals

As I mentioned in the previous section, a second route to come to a basic understanding of what conditionals are, is the onomasiological approach, through which we will identify conditionality not in terms of its default form *if*, but by identifying how the concept of conditionality, albeit provisionally characterised, is expressed in natural language. To do so, we can use the discussion

[11] However, as with the example in (1), the connection may be characterised as less stringently causal in terms of the aforementioned *enablement* (cf. van der Auwera, 1986; Sweetser, 1990).

[12] Although it is not mentioned by Wierzbicka, this definition is attributed by Braine to Geis and Zwicky (1971).

[13] Of course, the wording here leaves a lot to be desired. For instance, what does it mean for propositions to be contingent? Such issues will be discussed at length later on in this chapter.

in the previous section, which can be captured by Athanasiadou and Dirven's (1997a, p. 62) characterisation of 'the main feature of conditionality' as 'the mutual dependency between the two propositions in the sub-clause and in the main clause of conditional sentences'.[14]

Elder and Jaszczolt (2016, p. 38) argue that 'there are various uses of conditional sentences that have little claim to the conditionality of the corresponding thought and, on the other hand, there are various natural language expressions that strongly convey conditional thoughts as their primary intended meanings, despite being far removed from the syntactic form of a two-clause "if p, q" sentence'. Most studies indeed equate conditionals with the set of complex sentences involving a subordinate clause introduced by *if*.[15] Declerck and Reed (2001, pp. 8–9) define conditionals as 'two-clause structures' in which one is introduced by *if* or 'a word or phrase that has a meaning similar to *if* [...]'. The possibility of paraphrasing an utterance in the form of an *if*-statement however does not necessarily mean that the original utterance is conditional, as, for instance, Mauck and Portner (2006, p. 1331) argue. On the other hand, examples like (9) and (10) suggest that other constructions, such as verb-first clauses and even prepositional phrases, can function as antecedents of conditionals, as in (9) and (10) respectively.

(9) Had he done that, I would have been happy. (Comrie, 1986, p. 87)
'*If he had done that*, I would have been happy.'

(10) That course is mandatory: without a license, the couple will not be permitted to marry. (Reuneker, 2016, p. 126)
'The couple will not be permitted to marry *if they do not have a license*.'

Although in this study I will focus on conditionals expressed by means of *if* and Dutch *als* 'if', for future research, I consider it important to include such 'non-prototypical' conditional constructions, because they may identify specific niches of meaning associated with conditionals that are less apparent from the general meaning of the default markers of conditionality (cf. Levinson's 'M-principle,' which states that a marked expression receives a non-stereotypical interpretation; see Levinson, 2000, p. 39).

Gabrielatos (2010, p. 205; 2021) identifies constructions which resemble conditional *if* by scoring the degree to which they are marked for modality, which points to conditionals introduced by *supposing*, *provided* and *in case*. Comparing such constructions to *if* also shows that focusing on the meaning of *if* as a single conjunction does not do justice to form-meaning pairings as defined in construction grammar (cf. Goldberg, 1995, p. 4). This shifts the focus from the single lexical element *if* in isolation, to its grammatical and functional place in

[14]Note that the aforementioned circularity can also be found here, because Athanasiadou and Dirven include the phrase 'conditional sentences,' which, if left out, leads to inclusion of other bi-clausal structures, such as those in which the clauses are connected by a causal conjunction.

[15]See Dancygier and Sweetser (2005, p. 6) for discussion.

the linguistic context, which here means that it functions as a conjunction in a structure combining two verb phrases (see also Dancygier & Sweetser, 2005, pp. 7–15). In this view, the meaning of a conditional is not solely attributed to *if*, but also to the fact that there are two verb phrases combined into a complex sentence, and to the characteristics of those verb phrases, including, for example, their order and tense. It is, in this perspective, not strange that other elements, such as those found by Gabrielatos (2010), can be used to express meanings related to constructions in which *if* is used. Conditionals can then be seen as constructions, i.e., as *grammatical* means for connecting clauses in natural language, instead of *semantic* operators functioning on propositions in logic. This point will be taken up later in this chapter.

2.2.4 Characteristics of conditionals

In the previous sections, I discussed several accounts of conditionals. What most of the accounts share is the implicit assumption that there is one defining characteristic or a set thereof that is common to all conditionals. However, according to Goldberg (2006, p. 167), with reference to the work of Rosch (1978), in arguing for a functionalist approach to Subject-Auxiliary Inversion, such an assumption is 'widely recognised to be false'. Because of this, in combination with the observation that previous studies have not reached consensus on a definition, and because we are still in the introductory section of this dissertation, I will refrain from trying to provide a final definition. Instead, I will list the three main characteristics of natural language conditionals that have become apparent from the current discussion.

First, conditionals are expressed as bi-partite grammatical structures. 'Bi-partite' does not mean that the complex sentence must contain two complete clauses. Rather, the parts called 'antecedent' and 'consequent' are linguistic structures which express a proposition that can be evaluated truth-conditionally. Second, although the antecedent and consequent are often equated with the propositions they express, namely p and q, the conditional as a whole does not assert either of these propositions. Whether this should be called 'hypotheticality,' 'non-factuality' or 'unassertiveness' will be discussed in detail in sections 2.4 and 2.5. Third, a conditional presents the consequent as contingent on the antecedent. How this contingency should be analysed will be discussed too, in section 2.6.

2.2.5 Conclusion

As I mentioned before, the discussion in this section was not intended to provide a full understanding of natural language conditionals. Rather, I have reviewed accounts of conditionals in terms of their function and form to arrive at a provisional characterisation of conditionals as complex sentences in which the antecedent expresses a proposition p on which proposition q presented in the consequent is contingent, without actually asserting either of those propos-

itions. This enables us to include bi-partite structures ranging from default *if*-conditionals as in (11) to, for example, *in case*-conditionals as in (12) and conditional pseudo-imperatives as in (13), which, according to Clark (1993), 'seem to have the sense of conditionals'.[16]

(11) *If you increase your cadence*, you will run faster.

(12) *In case of an emergency*, use the stairs.

(13) *Open the Guardian* and you'll find three misprints on every page.(Clark, 1993, p. 79)

At the same time, treating conditionals as expressions which assert neither proposition expressed in each of their parts enables us to exclude other bi-partite constructions, most notably what is considered *if*'s 'stronger sibling' *since*, as contrasted in the minimal pair in (14) and (15) below.

(14) If John comes, I'll go. [...] (Levinson, 2000, p. 37).

(15) Since John comes, I'll go.

According to Levinson (2000, p. 37), the conditional in (14) licenses the implicature 'Maybe he will, maybe he won't'. This is not the case for *since* in (15). We will discuss the status of this implicature in more detail in section 2.4 on the non-truth-conditional meaning of conditionals, but first, we will discuss the truth-conditional analyses of conditionals in section 2.3.

2.3 Truth-conditional meaning of conditionals

2.3.1 Introduction

The logical analysis of natural language conditionals has a long and rich history. The main aim of this paragraph is to provide the background to the problem addressed in this dissertation, namely the differences between the use of the conditional operator of implication in formal logic ($\supset$) on the one hand, and conditional constructions, such as the conjunction *if* ($\rightarrow$), in natural languages on the other hand. In this section, I will discuss the truth-conditional analysis of conditionals in section 2.3.2. Next, I will discuss the problems connected to this analysis in section 2.3.3. This will provide the basis for two main issues connected to natural language conditionals, which will be addressed after the conclusion to this section in 2.3.4.

[16]See also Fortuin and Boogaart (2009) on conditional imperatives, and Łyda and Zasowska (2021) for a recent corpus-based study of this construction used as a means for the speech act of threatening.

2.3.2 Material implication

As Dancygier (1998, p. 1) remarks, conditionals have been studied since Aristotle. The first truth-conditional analysis of conditionals is attributed to Philo of Megara (300 BC) and to his tutor Dioduros Cronus, and with the added notion of *incompatibility*, to Chrysippus (279 BC; see Sanford, 1989, pp. 13–25).[17] The question of what a conditional means, how it should be evaluated, and what problems surround it, can also be found in Cicero's (106 BC) *Academica*, as can be seen below.

> In this very thing, which the dialecticians teach among the elements of their art, how one ought to judge whether an argument be true or false which is connected in this manner, "If it is day, it [the sun] shines," how great a contest there is; – Diodorus has one opinion, Philo another, Chrysippus a third. Need I say more? (Cooper, 1978, p. 158)

This shows not only that the study of conditionals has an extensive history, but also that the study of conditionals has been surrounded by problems from the start. According to Kneale and Kneale (1962, p. 134), the ancient Greeks used conditionals as statements in dialectical arguments to arrive at valid inferences in scholarly debate.[18] Conditionals were confined then to those uses in which the consequent followed logically from the antecedent, such as in (16) below.

(16) If x is a prime number, x can only be divided by 1 and x.

In Philo's view, the definition of a true conditional is that it cannot have a true antecedent and a false consequent. So, in (16), if the antecedent is true, the consequent cannot be false. However, it is not the case that this view uncontroversially determines the meaning of conditionals. As Kneale and Kneale (1962, pp. 128–138) show, from the start, different views on the analysis of conditionals have been defended and one of the most illustrative debates has been whether or not the core meaning of conditionals should be described in terms of what we will discuss below as 'material implication' (i.e., Philo's view, 'necessary connexion' cf. Kneale and Kneale, 1962, p. 138), or in terms of what has been called the 'defective truth table' in which a conditional with a false antecedent tells us nothing about the truth of the conditional itself.[19] As Bennett

[17] In the Philonian view, any conditional with a false antecedent is always true. For Chrysippus, however, a conditional is false when the denial of the antecedent is incompatible with the consequent, i.e., supposing that it is true that Johnny plays the guitar, 'If Johnny does not play the guitar, Johnny plays the guitar' is true in the Philonian view, because the antecedent is false, but it is false in the Chrysippian view, because the consequent is incompatible with the denial of the antecedent.

[18] See also Bennett (2004, p. 192) for a brief discussion on the history of logic and rhetoric. See, again, Kneale and Kneale (1962) for a more elaborate discussion.

[19] Note that 'necessary connexion' here refers to entailment, not a non-truth-conditional connection between p and q. We will discuss this latter connection in much more detail in section 2.6.

(2004, pp. 114–115) remarks, it would be a mistake to consider the use of the conditional as in (16), for which p entails q (i.e., the truth of p ensures that of q), as the only use, even though, as Kneale and Kneale write, it may be the case that the first analyses of conditionals were indeed inspired solely by their use as statements syllogistic reasoning.

It was Frege's (1879) *Begriffsschrift* and Whitehead and Russell's discussion of it in *Principia Mathematica* (1910, p. 7) that set the truth-conditional or, as Whitehead and Russell called it, 'material' analysis of conditionals (i.e., the Philonian view as discussed above) as the basis of the subsequent logical systems.[20] In the most basic of logical systems, *sentential* or *propositional logic*, an atomic sentence (an indivisible statement) is treated as a linguist object expressing a proposition. Truth conditions then are the conditions to be met in order for that proposition to be evaluated as true. In other words, we need to formulate what a possible world has to look like for the proposition to be true. Note that whether or not the actual world is like that possible world is not contained in a truth condition. The truth value assigned to a proposition is the result of its actual evaluation with respect to a possible world. As many utterances (i.e., sentences uttered in a specific context) are performed in relation to the actual world, that world is a likely candidate for evaluation of the proposition, which then comes down to whether or not the actual world resembles a possible world compatible with the proposition at hand. The evaluation of a proposition makes use of the 'principle of bivalence,' which is the following.

> There are exactly two truth-values, $\top$ and $\bot$. Every meaningful sentence, simple or compound, has one or other, but not both, of these truth-values. (Forbes, 1994, p. 45)

The evaluation of a proposition must, following this principle, result in one of two values: a proposition can have either $\top$ (*true*) or $\bot$ (*false*) as its truth value.

In a sentential or propositional logic, each statement is represented by a letter, such as p or q, and can be used in complex statements by applying the connectives $\neg$ (negation, *not*), $\wedge$ (conjunction, *and*), $\vee$ (disjunction, *or*), $\rightarrow$ (implication, *if... then*) and $\leftrightarrow$ (equivalence, *if and only if*). Within truth-conditional analyses, the meaning of complex statements, built up from one or more statements and the aforementioned operators, is calculated through the compositionality principle (attributed to Frege; see a.o. Dowty, Wall & Peters, 1981, p. 42, Hale, 1997, p. 249, Bunt & Muskens, 1999, p. 8) as 'a function of the meanings of its parts and of how they are syntactically combined' (Partee, 2007, p. 147) using the aforementioned logical operators. In such a truth-conditional analysis, 'if p, q' or '$p \rightarrow q$' is logically equivalent to material implication as used in truth-conditional logic, i.e., '$p \supset q$,' which in terms of our discussion above

[20] Although Sanford (1989, p. 52) argues that 'more careful writers these days avoid "material implication" and say that "$p \rightarrow q$" is a material conditional,' the term 'material implication' is still regularly used (see e.g., von Fintel, 2011; Magnus, 2015). To avoid terminological confusion, I will also use the term 'material implication' in this dissertation.

means that the statement '$p \rightarrow q$' has exactly the same truth conditions as '$p \supset q$'. This 'horseshoe analysis' is thus strictly truth-conditional,[21] meaning that the truth of the conditional statement as a whole is determined solely by the operator $\supset$ and the individual values of p and q (the aforementioned 'syntactic combination'), as presented in Table 2.1.

Table 2.1:
Truth table of P $\supset$ Q

	P	Q	$P \supset Q$
1	$\top$	$\top$	$\top$
2	$\top$	$\bot$	$\bot$
3	$\bot$	$\top$	$\top$
4	$\bot$	$\bot$	$\top$

As can be seen in Table 2.1, in the analysis of 'if P, Q' as '$P \supset Q$,' we determine the meaning of the conditional statement by defining under which conditions or truth values of p and q it is true. A conditional statement is then equivalent to '$\neg(P \wedge \neg Q)$,' as this is the only line (line 2) in Table 2.1 which has the value $\bot$ for '$P \supset Q$'. This means that only a conditional statement in which P has the value $\top$ and Q has the value $\bot$ is false as a whole (cf. Grice, 1989, p. 58; Gamut, 1991, p. 33; Bennett, 2003, pp. 20–22; Gerlofs, 2009, p. 16).[22,23] The truth of lines 3 and 4 in particular may seem counter-intuitive, but the reason for this outcome is that the *modus operandi* in truth-conditional logic

[21]This analysis is named after the binary material operator $\supset$, resembling a horseshoe (Copi, 1973, p. 15; Bennett, 2003, pp. 20–21). The symbol is derived from the letter C in Peano's work (see Sanford, 1989, p. 51), who used the letter in 'b C a' for 'b is a consequence of a'. He then introduced $\supset$ to reverse the notation, i.e., 'b C a' is the same as '$a \supset b$'. Whitehead and Russell (1910) transformed this symbol into $\supset$.

[22]Both $\rightarrow$ and $\supset$ are used in the literature to denote a conditional operator. Although Bennett (2003, Chapter 1), in discussing Grice's (1975) treatment of indicative conditionals, reserves $\supset$ for a strictly truth-conditional operator (material implication) and $\rightarrow$ for an operator including a non-truth-conditional connection between p and q, most authors (see e.g., Gamut, 1991; Magnus, 2015) use $\rightarrow$ as the symbol for the truth-conditional operator. (See Rescher, 2007, p. 39 for an overview of modes of implication and corresponding symbols. For a recent introduction to the material analysis of conditionals, see MacFarlane, 2020, Chapter 4.) I will use $\rightarrow$ for 'conditional,' including non-truth-conditional meaning aspects, and $\supset$ for 'material conditional'.

[23]For an interesting take on the commitment to '$\neg(P \wedge \neg Q)$' of speakers using conditionals as promises and, especially, threats, as in 'if you don't eat the dinner, I won't buy you this toy,' i.e., whether or not the speaker in this case is permitted to perform $\neg q$ in a situation in which the hearer ate the dinner (p), see Sztencel and Clarke (2018) and Sztencel (2018, Chapter 5). Although, for reasons of space, we cannot discuss this issue in any detail here, Sztencel and Clarke's (2018, p. 463) experimental results show that '$p \wedge \neg q$' is 'permitted for conditional threats, 'which undermines the claim that the $\sim(p \wedge \sim q)$ constraint is definitional of the encoded semantics, or 'core meaning,' of conditionals.

is to assign truth-values to complex statements by testing for the *falsity* of the complex statement. This can be seen by applying Table 2.1 to Cicero's earlier example, as adapted in (17) below.

(17) If it is day, the sun shines.

As '$p \supset q$' means that if p is true, then q must also be true, lines 1 and 2 in Table 2.1 show that the truth of both p and q guarantees the truth of 'if p then q,' while the truth of p and the falsity of q combined are inconsistent. Applied to (17), knowing that it is day, one *must* conclude that the sun shines. If one knows it to be day, but the sun is not shining, (17) is false. Since lines 3 and 4 in Table 2.1 take p to be false, 'if p then q' cannot be disproved and the whole statement is evaluated as true ($\top$).[24] Consequently, in cases in which p is false, the conditional does not provide any information about q, hence lines 3 and 4, when taken together, are indecisive on q. A conditional with a false antecedent would thus 'not tell us anything about the actual truth value of the consequent [...], and it is unclear what the truth value of "If A then B" would be' (Magnus, 2015, p. 26).

In truth-conditional analyses, 'meaning' is defined in terms of the relation between language and possible worlds. For now, we will look at declarative sentences, as they are used to assert propositions.[25] Declarative sentences assert whether or not the proposition expressed is true or false.[26] 'Synthetic sentences' are those sentences that express propositions that are true or false depending on the possible world they are evaluated in, as opposed to 'analytic sentences' which are necessarily true or false, i.e., in all possible worlds. The meaning of a proposition is determined by the conditions a world must meet for that proposition to be true (see Carston, 2011, p. 280; Heim & Kratzer, 1998, p. 1; Boogaart & Reuneker, 2017). [27] Returning to conditionals, then, we can clarify the discussion at hand by saying that uttering a conditional is to perform an assertive speech act combining two clauses in which the belief in a state-of-affairs in the proposition presented in the consequent is dependent on the belief in a state-of-affairs in the proposition presented in the antecedent.[28] It is,

[24]To address the problem of propositions being evaluated as *unknown*, rather than true or false, multi-valued logics have been proposed, such as the three-valued Łukasiewicz logic (Łukasiewicz, 1970; Seuren, 2010, Chapter 1; Saldanha, Hölldobler & Rocha, 2017), and trivalent semantics by de Finetti (1936, 1995) (see Lassiter, 2020). I will not discuss such logic systems further here.

[25]To be clear on terms, for now, I will reserve the term 'utterance' for the expression of a sentence expressed in a specific context, and 'sentence' as a grammatical entity used to express a proposition.

[26]In contrast to, for instance, imperative sentences, which do no assert a proposition, but issue a command and have a reversed direction of fit (cf. Searle, 1976, pp. 3–4).

[27]What this referential meaning exactly is, is yet another matter. See e.g., Boogaart and Reuneker (2017, pp. 189–191), Lakoff (1987), Langacker (1991, pp. 1–2), Langacker (2008, p. 55).

[28]Of course, there are other types of speech act next to assertives, such as the five main types defined by Searle (1976), namely directive, commissive, expressive, and decalarative speech acts. For now, we will focus on conditionals with declarative consequents performing assertive speech acts, but see section 5.8 for other sentence types and types of speech acts.

however, not the case that 'assertion' here refers to the individual propositions p and q expressed in the antecedent and consequent, but to the conditional as a whole, i.e., the antecedent and consequent as combined in a conditional construction. For the appropriate uttering of a conditional, it is not so much the individual truth values of p and q, but their combination that counts. (This is far from uncontroversial, of course, and we will come back to this later in section 2.5 in more detail.) Let us revisit Magnus's (2015, p. 26) remark, in which he says that a conditional with a false antecedent would thus 'not tell us anything about the actual truth value of the consequent [...], and it is unclear what the truth value of "If A then B" would be'. It is important to note here that $\top$ and $\bot$, in the logical evaluation of complex statements, are not the result of an evaluation in terms of contingency to the world referred to, as with atomic statements such as p and q, but in terms of validity. A true complex statement is a statement of which the combination of its parts (statements and operators) yields a true statement. Note furthermore that statements are evaluated in terms of truth ($\top$ or $\bot$), while arguments, built up from (simple or complex) statements, are evaluated in terms of validity. Copi (1973, pp. 4–5, 273) remarks that the term *validity* is reserved by 'some logicians [...] to characterise statements which are *logically true*,' but I will use the term here in Copi's sense, namely for arguments only. Applied to Table 2.1, this means that p and q as atomic sentences are true or false in the sense of their contingency to a world, while '$p \supset q$' as a complex statement is *logically* true or false, as its truth is a compositional function of its parts, i.e., contingency on situations referred to is only indirect. As Cruse (2000, p. 29) argues, 'the definition of material implication makes no reference to the meanings of the propositions, merely to a relation between their truth values'. This results in discrepancies between the meaning of conditionals in logic and in natural language, such as the conclusion that a conditional statement is true in any case in which proposition p expressed in the antecedent is false. I will discuss these problems next in section 2.3.3.

2.3.3 Paradoxes of material implication

The analysis of conditionals in terms of material implication results in discrepancies between what conditionals mean from a logical perspective, and how they are used in natural language. When Peirce (cited in Sanford, 1989, p. 50) discusses the aforementioned Philonian analysis of *if*, he remarks the following.

> The Philonian view has been preferred by the greatest logicians. Its advantage is that it is perfectly intelligible and simple. Its disadvantage is that it produces results which seem offensive to common sense. (Peirce, 1933, p. 279)

Peirce (1933) refers to a mismatch between the rules governing logic and the rules involved in natural language. While the first set of rules governs the evaluation of statements and arguments in terms of 'well-formed formulae' (*wff's*;

Magnus, 2015, p. 30), the second refers to the cooperative communication in terms of what, in parallel, may provisionally be called 'felicitous discourse'. As has been observed by many, natural language, in contrast to logic, requires more from a conditional statement than the logical operator $\supset$ and individual truth values (see e.g., Austin, 1970; Grice, 1975; Haiman, 1978, p. 564; Comrie, 1986; Kratzer, 1986; Bennett, 2003; Dancygier, 1998, p. 4; Bennett, 2004; Dancygier & Sweetser, 2005). This gives rise to differences between conditionals in natural and formal languages, called 'the paradoxes of material implication'.[29] In the remainder of this section, I will discuss two main problems.

Strawson (1952, pp. 86–87) distinguishes two groups of theorems with respect to the truth-conditional analysis of natural language conditionals. He argues that the first group, reproduced in (18), is non-problematic.

(18) Theorems in which $\supset$ resembles 'if'

a. $((P \supset Q) \wedge P) \supset Q$

b. $((P \supset Q) \wedge \neg Q) \supset \neg P$

c. $(P \supset Q) \leftrightarrow (\neg Q \supset \neg P)$

d. $((P \supset Q) \wedge (Q \supset R)) \supset (P \supset R)$

Given the conditional statement in (1), repeated below, and the truth of p 'I catch the train,' the conclusion following (18a) is that 'I will come on time' (cf. line 1 in Table 2.1).

(1) If I catch the train, I will come on time.

Given the same conditional statement and the falsehood of q, the conclusion to be drawn is 'I did not catch the train' (cf. (18b) and line 4 in Table 2.1). The theorem in (18c) warrants the same conclusion, namely that from 'if P, Q' one can infer 'if not Q, not P,' i.e., 'If I do not come on time, I will not have caught the train'. The theorem in (18d) comes down to a hypothetical syllogism, for which an extra argument is needed, as provided below (19) .

(19) If I catch the train, I will come on time. If so, I will join the party.

The extra argument will be proposition r. It follows from (18d) that, given 'If I catch the train, I will come on time' $(P \supset Q)$ and 'If I come on time, I will join the party' $(Q \supset R)$, one is entitled to conclude 'If I catch the train, I will join the party' $(P \supset R)$. In these cases, the theorems in (18) show that the

[29]The term *paradox* is meant here in terms of 'shortcomings in the match between the formal analysis and the natural language data it might be thought to cover' (von Fintel, 2011, p. 1519), not in the technical sense of an internal inconsistency of a logical system.

material conditional resembles natural language *if*.[30,31] Before arguing that in these cases too a specific discrepancy arises, I will discuss the theorems that are presented as problematic by Strawson.

Strawson's theorems in (20) present problems for equating natural language *if* to the material conditional. It can be seen that (20a) and (20b) amount to the conclusion that, when p is false, the conditional statement is always true, whether or not q is true (cf. lines 3 and 4 in Table 2.1).

(20) Theorems in which $\supset$ does not resemble 'if'

a. $\neg P \supset (P \supset Q)$
b. $\neg P \supset (P \supset \neg Q)$
c. $Q \supset (P \supset Q)$
d. $Q \supset (\neg P \supset Q)$
e. $\neg P \leftrightarrow ((P \supset Q) \wedge (P \supset \neg Q))$

Applied to the example in (1), this warrants the conclusion that in case 'If I catch the train' turns out false, the complete statement will be true. In other words, when p is false, q is irrelevant to the evaluation of the conditional as a whole, which is essentially restated in (20e). Note that this is what differs in the 'defective truth table' in Table 2.2, as mentioned earlier in this section, which leaves the evaluation of the conditional undecided in case of a false antecedent.

Table 2.2:
Defective truth table of 'If P *then* Q*'*

	P	Q	$P \supset Q$
1	$\top$	$\top$	$\top$
2	$\top$	$\bot$	$\bot$
3	$\bot$	$\top$	...
4	$\bot$	$\bot$	...

As can be seen in the literature on conditionals, this paradox is exemplified by showing that any conditional is true in case the proposition expressed in the antecedent is false. In other words, any proposition can follow a false proposition expressed in the antecedent without altering the truth value of the whole conditional, as in the example in (21) below.

[30](18b) and (18c) amount to *contraposition*, which has its own set of problematic cases (see e.g., Jackson, 1987). The theorem in (18d) suffers from 'strengthening the antecedent' (cf. Adams, 1966; Jackson, 1987; Cooper, 1978). These problems will not be discussed here.

[31]One could also argue that it is the other way around, i.e., that in these cases natural language *if* resembles the material conditional, depending on one's view on the origins or nature of logic. See again Kneale and Kneale's *The Development of Logic* for an elaborate discussion.

(21) If I propose marriage to Margaret Thatcher, she will leap for joy and urge me to accompany her to a mountain retreat in Peru. (Sanford, 1989, p. 54)

Taking the theorems in (20a) and (20b), or lines 3 and 4 in Table 2.1 together, they license the conclusion that (21) must be true as whole, irrespective of the truth or falsity of q, because p is false – 'if p, then q' cannot be disproved with a false antecedent, rendering (21) logically true.[32] In other words, q is irrelevant to the evaluation of conditionals with false antecedents. A similar result is obtained by evaluating the theorems in (20c) and (20d). From these theorems, it can be seen that the truth of p is irrelevant to the evaluation of the conditional as a whole in the case that q is known to be true (cf. lines 1 and 3 in Table 2.1). Applied to (1), this means that, when it is known that the speaker will come on time, the conditional as a whole is true, whether or not she caught the train.

These problems are summarised by Lewis (1912, p. 522) as 'two somewhat startling theorems: (1) a false proposition implies any proposition, and (2) a true proposition is implied by any proposition'. The knowledge of the falsity of p or the truth of q renders any conditional statement logically true, which does not reflect the use of conditionals in natural language. The problem of a false antecedent necessarily resulting in the truth of the whole conditional is the first of two main problems. The second problem concerns the connection between p and q. This commonly mentioned problem in linguistic studies of conditionals concerns line 2 in Table 2.1, which warrants that all conditional statements in which p and q are (synthetically) true (i.e., in reference to a world), are logically true as a whole. In other words, the analysis is purely compositional, meaning that the truth values of the individual parts determine the truth value of the whole. This licenses not only non-problematic examples discussed above, such as those in (1) and (17), and examples such as the conditional in (22) below, but also examples as in (23).

(22) If you touch me, I'll scream. (Leech, 1971, p. 110)

(23) If Paris is the capital of France, (then) two is an even number. (Sweetser, 1990, p. 113)

In (22), the truth value of the complex statement captures the semantics of the complex sentence, i.e., the speaker will have spoken the truth if he or she is touched and, consequently, screams. Both events are related through a volitional schema, i.e., the antecedent is presented by the speaker as a reason for screaming. This connection has no bearing to the truth-conditional evaluation of (22), however. In the material analysis, the evaluation of both (22) and (23) results in the value $\top$ in case both propositions are taken to be true. However, there is no clear way of interpreting two being an even number as a

[32] Note here that Sanford intends this example to reflect the clear falsity of p, since he 'will not propose marriage to Margaret Thatcher'.

consequence of Paris being the capital of France. On this point, the difference between conditionals in logic and in those used in natural discourse seems clear. As Sweetser (1990, p. 113) asks, 'under what circumstances would the evenness of two be conditionally dependent on or related to Paris' being the capital of France?'.[33] These circumstances are present in (22) (i.e., the volitional schema), but not in (23). The problem introduced by line 1 in Table 2.1 is thus that any two propositions that are true render '$p \rightarrow q$' true, as it is truth-conditionally identical to '$p \supset q$,' while natural language users typically require a connection between both propositions. Although I will discuss these two problems connected to material implication separately in more detail, it must be noted that Strawson's non-problematic theorems in (18) are not free from the problem caused by a lack of connection between the two propositions expressed in conditional form. In other words, any set of propositions, connected or unconnected, can be evaluated using Strawson's theorems. The problem of false antecedents and that of connection are, however, distinct problems. For instance, the problem in (21) concerns the falsity of the antecedent only, as there is no lack of connection, because Sanford obviously presents marrying Margaret Thatcher and leaping for joy as connected.

2.3.4 Conclusion

The reason I discussed the truth-conditional analysis of the meaning of conditionals in this section in some detail is not only the historical and theoretical importance of material implication, but also the identification of two main discrepancies between the conditional in logic and in natural language. First, the knowledge of p being false, or q being true renders any conditional statement true, while this does not reflect the use of conditionals in natural language. In the next section, we will see that one would not use a conditional in such cases, i.e., in cases in which one knows that either p is false, or that q is true. Second, a connection between p and q is irrelevant to the truth values of the complex statement, licensing logically correct, but incoherent conditionals of the type in (23), which also does not reflect the use of conditionals in natural language.

It is important to note that from the discussion above one might draw the conclusion that a truth-conditional analysis cannot capture what conditionals are about and that it therefore should be abandoned altogether. This is indeed a perspective on conditionals taken by scholars from fields ranging from semantics and philosophy (see e.g., Edgington, 1986; Bennett, 2003, Chapter 3; Weirich, 2015, Chapters 4, 5) to functional and cognitive linguistics (see e.g., Akatsuka, 1986; Sweetser, 1990, Chapter 5). This is especially the case in many usage-oriented accounts. If it is mentioned at all, it is mostly quickly

[33] Of course, there can always be devised a context in which such a consequential relation would hold, such as a game in which the front of a card reading 'Paris is the capital of France' has a backside which reads 'two is an even number'. Note that this would actually confirm that q must be able to be at least construed as a consequence of p.

dismissed.[34] Some linguists use the specific focus of formal semantics as an argument against truth-conditional analyses of conditionals (see e.g., Edgington, 1986; Wierzbicka, 1997; Mayes, 1994, pp. 451–452; Sweetser, 1990, p. 113).[35] This is, in my view, not entirely deserved, as the scope of a truth-conditional analysis is different, as can be seen in, for instance, in von Fintel's (2011) definition of truth-conditional semantics below.

> The questions for the semanticist are two-fold: (i) what is the formal analysis of the different meanings that conditionals convey, and (ii) how are these meanings compositionally derived? (von Fintel, 2011, p. 1518)

Semantics in this sense is concerned with only a part of the meaning of natural language. Logical semantics forms 'no more than a part of the theory of meaning' (Gamut, 1991, p. 195).[36] With respect to conditionals, Stalnaker (1968, p. 110) argues that 'there are further rules beyond those set down in the [truth-conditional] semantics, governing the use of conditional sentences. Such rules are the subject matter of a *pragmatics* of conditionals'. In this view, and even if one believes natural language conditionals may never express the material conditional, the material conditional is 'simply a *definitional introduction* of this conditional,' i.e., a starting point adequate for the further analysis of conditionals in terms of sentential logic (cf. Forbes, 1994, p. 49).

In this section, we reviewed a truth-conditional analysis of conditionals to arrive at a better understanding of their semantics. This enables us to determine the focus in investigating the differences between the logical operator $\supset$ and the grammatical conjunction *if* (and other conditional constructions): the truth-conditional status of the propositions expressed in the antecedent and consequent, and a connection between the antecedent and consequent. I will discuss these two issues in the next section in order to describe what Stalnaker described as 'a *pragmatics* of conditionals' and, of course, to evaluate whether this is indeed (primarily) a pragmatic matter.

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[34] Cruse (2000, p. 9) argues that 'material implication is essentially of no interest to linguistic semantics [...],' although he argues for strict implication, as entailment, in contrast to material implication, which does make reference to the (non truth-conditional) meaning of propositions.

[35] For a recent overview of Edgington's work on conditionals, and related discussions by other scholars, see Walters (2021).

[36] Delimitation of *meaning* is heavily debated and not only a scope of analysis, but also a view on the nature of language. As may be expected, this dissertation is not the place to discuss this issue in extensive detail. See for discussion e.g., Stalnaker (1972, p. 138), Salmon (2005, p. 317), Ariel (2010). For specific discussion on this issue in relation to conditionals, see Lewis (1918, pp. 291–339) on 'strict implication', Ramsey (1950), Stalnaker (1968), Lewis (1973b) on 'possible worlds' and, for introduction to and discussion of these approaches, see Cantwell (2018), Adams (1975) on probability theory, and Anderson and Belnap (1975) on relevance logic. See also Gerlofs (2009, pp. 23–39) and von Fintel (2011) for overviews.

2.4 Non-truth-conditional meaning of conditionals

2.4.1 Introduction

In this section, I discuss the framework used for analysing conditionals and their non-truth-conditional meaning found in natural language. I will offer a brief introduction to Grice's model of (non-natural) meaning in section 2.4.2, before discussing conventional and non-conventional types of meaning in sections 2.4.3 and 2.4.4 respectively. In section 2.4.5, I will clarify how I use the term 'non-truth-conditional meaning' in this dissertation. In section 2.4.6, I will provide a detailed discussion of two types of conventional meaning in order to avoid the terminological confusion present in parts of the pragmatic literature. Next, in section 2.4.7, I will provide a brief conclusion, before moving on to the analysis of the status of proposition p expressed in the antecedent in section 2.5, and the connection between the antecedent and consequent in section 2.6.

2.4.2 Grice's model of meaning

Before discussing the two non-truth-conditional meaning aspects of conditionals in the following sections, I will try and clarify the use of the term 'non-truth-conditional meaning' as it is used in this dissertation. The starting point for this discussion is where we ended the previous section, namely that a strictly truth-conditional analysis of conditionals cannot describe why, in natural language, we do not use conditionals in situations in which we want to assert their propositions, and why we seem to need a connection between antecedent and consequent for the utterance of a conditional to be felicitous.

Modern pragmatics essentially started with Grice's 'Logic and Conversation' in 1957 (Grice, 1957, 1975, 1989), in which Grice developed his theory of implicatures to deal with aspects of meaning that could not readily be analysed in terms of truth-conditional logic, as introduced below.

> It is a commonplace of philosophical logic that there are, or appear to be, divergences in meaning between, on the one hand, at least some of what I shall call the formal devices – $\sim$, $\wedge$, $\vee$, $\supset$, $(\forall x)$, $(\exists x)$, $(\imath x)$, (when these are given a standard two-valued interpretation) – and, on the other, what are taken to be their analogues or counterparts in natural language – such expressions as *not*, *and*, *or*, *if*, *all*, *some* (or *at least one*), *the*. (Grice, 1989, p. 22)

To account for these divergences, Grice (1989, p. 24) introduced the term 'implicature,' which refers to what is 'implied, suggested, meant' instead of 'what is said'.[37] According to Grice (1989, p. 87), 'what is said' is the proposition

[37]Cohen (1971, p. 68) remarks that Grice already explained the concept of implicature in Grice and White (1961), but then he still called it 'implication,' which, as we have seen, denotes conditionals in logic, which does not help distinguishing between types of meaning.

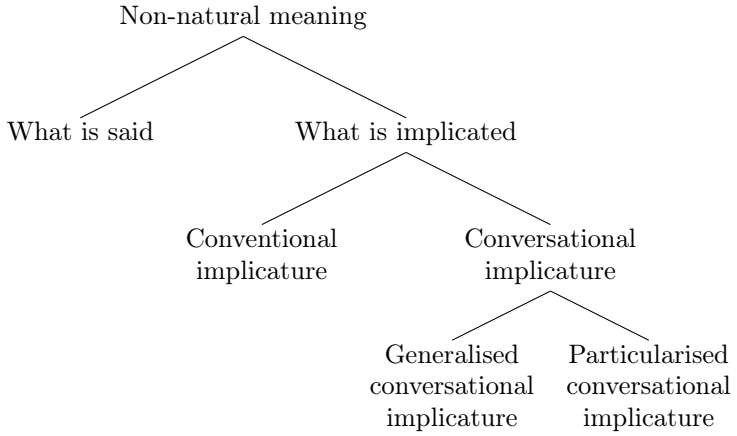
that is expressed by a sentence, and it is what a speaker can ultimately be held accountable for: 'what is said' (S) means *p* 'in virtue of the particular meanings of the elements of S, their order, and their syntactical character' (i.e., 'Syntactic Correlation,' see Bach, 2001, p. 15; for discussion of the concept of 'what is said,' see below, and Baptista, 2011). Next to this sentence meaning, a speaker may implicate additional meaning. Such 'additional' meaning is carried by implicatures, which come in two main types. The first type, conventional implicature, supplies non-truth-conditional meaning independent of its context. This means that, in Levinson's (2000, p. 14) words, 'what is coded by the linguistic system is the sum of what is said (roughly the truth-conditional content) and what is conventionally implicated'.[38] Grice, as we will see in the next section, unfortunately, offers only a brief discussion on this type of implicature. The second type, conversational implicature, is dependent on context, and is discussed in great detail by Grice (see section 2.4.4). Conversational implicatures can be quite individual and strongly context dependent, in which case they are called particularised conversational implicatures. In case they are more frequent and only weakly context dependent, they are called generalised conversational implicatures. Conversational implicatures have received more much attention than conventional implicatures in the field of pragmatics at large. Both types do not, by definition, contribute to truth-conditional meaning (i.e., 'what is said,' see e.g., Grice, 1989, p. 25; Blakemore, 2002, p. 47; Bach, 2001, p. 40; Birner, 2013, p. 99), but they do play an important role in analysing the ways in which meaning in conversation extends beyond its contribution to the truth-conditional contents of what was said.

Figure 2.1 below offers an overview of the standard view of Grice's model of non-natural meaning.[39]

[38]Below, I will raise the issue to what extent conventional implicatures should be seen as the result of inferences, as that would place them outside what is strictly coded by the linguistic system.

[39]I will not discuss 'natural meaning' here. For the difference between natural and non-natural meaning, see Grice (1957), and, for a brief explanation, Terkourafi (2009a, pp. 28–29), Terkourafi (2009b, p. 80).

Figure 2.1:
Grice's model of non-natural meaning



As we see here, 'non-natural meaning' includes both conventional and context-dependent aspects of meaning (or 'language-dependent' and 'intentional' or 'speaker-dependent' aspects of meaning; cf. Terkourafi, 2009a, pp. 80–81). Although this figure presents a clear picture of Grice's model of non-natural meaning, and the distinction between conventional or sentence meaning (including both truth-conditional meaning or 'what is said' and the non-truth-conditional meaning contribution of conventional implicatures), and conversational or utterance meaning (including both particularised and generalised conversational implicatures) is used often to distinguish between semantics and pragmatics, it does obscure the fact that 'meaning' here refers to the meaning of either expressions/sentences (i.e., linguistic constructs), or utterances (i.e., contextualised usage events), but not to the meaning of individual words or phrases.[40] This difference is often neglected, but because it is of importance to the analysis of conditionals offered in the next section, I will provide a discussion of this issue to prevent terminological confusion in section 2.4.6. First, however, I will elaborate on the notions of conventional implicature, conversational implicature, and non-truth-conditional meaning in sections 2.4.3 to 2.4.5 respectively.

[40]For discussions of the concept of 'what is said', see e.g., Levinson (1983, pp. 42, 96), Levinson (2000, pp. 14, 170), Potts (2007a, p. 666), Recanati (1993, Chapter 13). For discussion and the notion 'structured proposition' with respect to the work of Grice, see Bach (1994, pp. 142–143). On the notions of 'impliciture' and minimal propositions, see Bach (2001).

2.4.3 Conventional implicature

As mentioned above, 'what is said' accounts for the truth-conditional meaning of an expression (for an elaborate discussion, see Baptista, 2011), whereas 'what is implicated' accounts for the non-truth-conditional meaning of an expression or utterance. Such implicatures come in two main types: conventional and conversational implicatures. The former type is reserved for meaning that is conventionally associated with a certain expression, but, as the name suggests, does not affect truth-conditions. Grice provides the example in (24) below.

(24) He is an Englishman; he is, therefore, brave. (Grice, 1989, p. 25)

The truth-conditions for *therefore* are exactly those of *and*, as in (25) and its logical counterpart $\wedge$, and even those of *but*, as in (26).

(25) He is an Englishman, and he is brave.

(26) He is an Englishman, but he is brave.

As *therefore* and *but* have the same truth-conditions as *and*, and from a purely truth-conditional perspective, they are indistinguishable from $\wedge$, as can be seen in Table 2.3 below.

Table 2.3:
Truth table of $\wedge$, and, but, *and* therefore

	P	Q	$P \wedge Q$	'P and Q'	'P but Q'	'P therefore Q'
1	$\top$	$\top$	$\top$	$\top$	$\top$	$\top$
2	$\top$	$\bot$	$\bot$	$\bot$	$\bot$	$\bot$
3	$\bot$	$\top$	$\bot$	$\bot$	$\bot$	$\bot$
4	$\bot$	$\bot$	$\bot$	$\bot$	$\bot$	$\bot$

In contrast to what Table 2.3 seems to suggest, the meanings of *and*, *but*, and *therefore* can hardly be called identical in natural language. Grice (1989, p. 25) argues that by uttering (24) he would have committed himself, 'by virtue of the meaning of my words, to its being the case that his being brave is a consequence of (follows from) his being an Englishman'. However, he continues, he has not *said* that his braveness follows from the man being an Englishman. He has 'indicated, and so implicated' it, but it is not part of what was (truth-conditionally) said. These aspects of meaning are conventionally tied to the words *therefore* and *but*, and thus not dependent on any specific context. Unfortunately, as Potts (2007a, pp. 665–666) remarks, Grice offers only one small paragraph on the subject of conventional implicatures before moving on to conversational implicatures, leaving much detail to be explained. It may therefore not come as a surprise that Grice's notion of conventional implicature instilled

many debates and different analyses, or has been abandoned altogether in some theoretical frameworks.[41] We will continue the discussion of conventional implicatures in more detail in section 2.4.6 below, but to be able to do so, we will first contrast conventional implicatures with conversational implicatures.

2.4.4 Conversational implicature

Next to conventional implicatures, the other type of implicature is the conversational implicature, which is non-truth-conditional as well, but context dependent, thus non-conventional by definition. If we look at *and* again, we can contrast the example in (25) with the example in (27) below.

(27) She jumped on the horse and rode into the sunset. (Blakemore & Carston, 1999, p. 1)

This example licenses the implicature that the jumping occurred before riding into the sunset. This cannot be attributed to *and*, however, as in (25) no such implicature arises. The implicature is context-dependent to a certain degree, and can be derived on basis of the mutual expectation that the interlocutors are cooperative in their conversation, cf. Grice's 'Cooperative Principle' in (28).

(28) Cooperative Principle
Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged. (Grice, 1989, p. 26)

Furthermore, expecting the other interlocutor to adhere to the Cooperative Principle, the inference can be calculated from one or a combination of the four maxims and their sub-maxims adapted from Grice (1989) in (29) below.

(29) Grice's conversational maxims

1. Quantity
    i. Make your contribution as informative as is required (for the current purposes of the exchange).
    ii. Do not make your contribution more informative than is required.
2. Quality
    i. Do not say what you believe to be false.

[41] Most notably, in Relevance Theory, conventional implicatures are not acknowledged. See for instance Carston (2006, pp. 653–654), who mentions, in a footnote, the following: 'I omit from this chapter any discussion of the Gricean notion of "conventional implicature," a category which simply does not arise within relevance theory and which is currently seen, across various pragmatic frameworks, to be in need of radical reworking'. Here, linguistic devices generating what are called conventional implicatures are analysed as elements 'encoding procedural constraints on the inferential processes involved in deriving conversational implicatures'.

ii. Do not say that for which you lack adequate evidence.

3. Relation
   i. Be relevant.
4. Manner
   i. Avoid obscurity of expression.
   ii. Avoid ambiguity.
   iii. Be brief (avoid unnecessary prolixity).
   iv. Be orderly. (Grice, 1989, pp. 26–27)

From (27) and the fourth sub-maxim of manner in (29) we can infer that the order in which the events are described would, under normal circumstances, match the order in which they occurred. A further distinction within the category of conversational implicatures made by Grice is that between generalised and particularised conversational implicatures, the former being less context dependent, or a default implicature, as in (27), the latter being more context dependent, or particular.

2.4.5 Non-truth-conditional meaning

The term 'non-truth-conditional meaning' will be used here in Grice's sense, namely to refer to those aspects of meaning that do not contribute to truth-conditions. This meaning includes both conventional and non-conventional (i.e., conversational) implicatures.[42] This does not mean, however, that the difference between conventional and conversational implicatures is of no importance in this study. In fact, they differ in important ways. First, conversational implicatures must be calculable using the maxims in (29), whereas conventional implicatures are tied to words or expressions and, therefore, do not need to be calculated (but see the discussion in section 2.4.6 below). Second, conversational implicatures are cancellable (or 'defeasible'), meaning that an implicature p can be cancelled in specific circumstances by adding "'but not p" or "I do not mean to imply that p"' (Grice, 1989, p. 44). The conversational implicature of order in (27), for instance, can be cancelled by adding 'but not in that order', whereas the conventional implicature of contrast tied to *but* in (26) cannot. Adding 'but I do not mean to say that Englishmen are generally not brave' would make for an incoherent or even an infelicitous utterance. The other side of this characteristic is that conversational implicatures are reinforceable (cf.

[42] I will not go into the related issue of 'non-at-issue content' here. 'At-issue content' (roughly) corresponds to truth-conditional content. Potts (2007b, p. 666) for instance identifies it with 'descriptive meanings' and 'what is said', and 'non-at-issue content' is then used to analyse expressive meaning contributions (see e.g., Potts, 2005; McCready, 2010, p. 2). 'At-issueness', however, does not coincide (completely) with dimensions like conventional and conversational meaning, and truth-conditional and non-truth-conditional meaning, and introduces yet another dimension to the semantics-pragmatics interface (see e.g., Horn, 2016).

Sadock, 1978, p. 294), as one can continue (27) by explicitly saying 'and I mean in that order' without being redundant, whereas saying 'and I mean to say that Englishmen are generally not brave' would result in redundancy. While there are other characteristics and tests of conversational implicatures,[43] the most used is cancellability and used in tandem with calculability, it should be possible to discern conversational from conventional implicatures.

I will use Grice's framework as much as possible in this dissertation, because it is considered the basis for many subsequent theories of pragmatics. If needed, I will refer to what are known as the 'Neo-Gricean frameworks' by Horn (1984) and Levinson (1983, 2000), who continue in the line of Grice, and basically uphold the types of implicatures discussed above, but reduce the four Maxims in (29) to two and three principles respectively.[44] I will not use the 'Post-Gricean' framework of Relevance Theory (Sperber & Wilson, 1986), which reduces Grice's four Maxims to one 'Principle of Relevance', mainly because it changes where to draw the line between truth-conditional and non-truth-conditional meaning in important ways.[45] Most prominently, Sperber and Wilson (1986, p. 182) introduce the term (pragmatic) 'explicature' ('an explicitly communicated assumption') to include inferred meaning (implicatures in Grice's sense) into truth-conditional meaning (Sperber & Wilson, 1986, pp. 38, 182). This means that a (truth-evaluable) proposition is already enriched by pragmatic inference, i.e., pragmatic principles are needed before language users can determine what is explicitly communicated, resulting in what is called 'explicature'. To a lesser degree, and upholding the basic Gricean distinctions between 'what is said' and 'what is implicated', this standpoint is also defended by Levinson (2000, pp. 166–167), who views these inferences as 'intrusive implicatures', also allowing for pragmatics to precede semantic evaluation of a proposition.[46]

[43]Most notably 'non-detachability', which suffers from excluding manner-based implicatures, and 'indeterminacy'. See Grice (1989, Chapter 3) and Sadock (1978, p. 284).

[44]For Horn (1984), there are two pragmatic principles: the Q-principle for Quantity and the R-principle for Relation. The Maxim of Quality is not represented in Horn's principles, because it is preliminary to the working of the principles. Without it, 'the entire conversational and implicatural apparatus collapses' (Horn, 1984, p. 12). Like Horn, Levinson (2000) considers the Maxim of Quality to be preliminary to the working of the principles he proposes. Contrary to Horn's reduction of Grice's four maxims to two principles, Levinson (2000) argues for three principles: the Q-principle for Quantity, the I-principle for Informativeness, and the M-principle for Manner.

[45]For the same reason, and for reasons of space, I will not discuss Elder and Jaszczolt's (2016) framework of 'Default Semantics', and its application to (biscuit) conditionals as presented in detail by Elder (2019a), nor Sztencel's (2018, pp. 75–76) analysis of conditionals in terms of 'semantic holism', which rejects a distinction between logical and inferential relations, and suggests that the 'meaning/semantics of an expression is determined by its place in the network of beliefs constituting entire theories or even a cogniser's entire belief system [...]'. For an introduction, see Chapter 4, and for an application to conditionals, see Chapters 5 and 6 in Sztencel (2018).

[46]For elaborate overviews and discussions of pragmatics frameworks, which falls outside the scope of this dissertation, see a.o. Ariel (2010), Chapman (2011, Chapter 5), Carston (2002, Chapter 2), Levinson (2000, Chapter 3), Szabó (2005).

2.4.6 A note on conventional meaning and conventional implicature

Before returning to the topic of conditionals, I deem it necessary to try and offer some terminological clarity concerning the notions 'conventional meaning' and 'conventional implicature', because in a (large) part of the pragmatic literature, these terms are used either interchangeably, or 'conventional meaning' is left out of the picture altogether. Note, however, that this section is not merely an exercise in close-reading of Grice (1989), or an insistence on clear terminology for the sake of terminology. The difference between conventional meaning and conventional implicature will turn out to be of importance to the analysis of conditionals offered in the remainder of this dissertation.

In the previous sections, we distinguished between conventional implicatures and conversational implicatures, and this distinction is vital for understanding Grice's model of meaning. As announced in the introduction to this section, however, this 'standard picture' of Grice's model of (non-natural) meaning is often presented without a clear distinction between meanings on word and sentence level. This, in my view, introduces terminological problems when dealing with conventional implicatures. Therefore, we will discuss this distinction in detail in the remainder of this section.

To clarify the issue at hand, let us analyse Levinson's criticism on Grice's analysis of conventional implicatures below.

> Grice provides just two examples: the word *but* has the same truth-conditional (or truth-functional) content as the word *and*, with an additional conventional implicature to the effect that there is some contrast between the conjuncts (Grice, 1961); the other example is the word *therefore* which Grice holds contributes nothing to the truth conditions of the expressions it occurs within (Grice, 1975: 44). (Levinson, 1983, p. 127)

We see here that 'contrast' is described as a conventional implicature of *but*. For *therefore*, this conventional implicature would be 'consequence'. Levinson (1979, p. 214) furthermore mentions the following.

> I believe that at least in some of their uses, words like *however*, *moreover*, *anyway*, *well*, *still*, *furthermore*, *besides*, *although*, *okay*, *oh*, and phrases like *in fact*, *in a way*, *in any case*, *all in all*, *be that as it may*, will have to be treated as carrying conventional implicatures. In addition of course there are socially deictic elements like *sir*, *madam*, *mac* or *mate*, *your honor*, *professor*, and summons forms with socially deictic implication like *hey*, *excuse me*, and polite formulae like *how do you do*. (Levinson, 1979, p. 214)

It is not entirely clear how 'carrying conventional implicatures' must be interpreted here, but in view of the above, I think it safe to say that 'conventional implicatures' here actually refers to the conventional meanings of the words and phrases summed up. Similarly, Birner (2013, pp. 66–68), in discussing her example reproduced in (30) below, mentions how *but* has 'no effect on the truth of the utterance'.

(30) Clover is a labrador retriever, but she's very friendly. (Birner, 2013, p. 66)

She continues by arguing that the meaning aspect of contrast is 'an implicature; since it is conventionally attached to the use of the word *but*, it is a conventional implicature'. While this is, to my knowledge, a very common interpretation of Grice's notion of conventional implicature, perhaps even the dominant interpretation in the field of pragmatics, it does not in fact concur with Grice's brief and, as mentioned above, perhaps somewhat obscure discussion of conventional implicatures, reproduced in full below.

> In some cases the conventional meaning of the words used will determine what is implicated, besides helping to determine what is said. If I say (smugly), *He is an Englishman; he is, therefore, brave,* I have certainly committed myself, by virtue of the meaning of my words, to its being the case that his being brave is a consequence of (follows from) his being an Englishman. But while I have said that he is an Englishman, and said that he is brave, I do not want to say that I have SAID (in the favored sense) that it follows from his being an Englishman that he is brave, though I have certainly indicated, and so implicated, that this is so. I do not want to say that my utterance of this sentence would be, STRICTLY SPEAKING, false should the consequence in question fail to hold. [...] (Grice, 1989, pp. 44–45)

As can be read in the beginning of this passage, Grice distinguishes between conventional *meaning* and conventional *implicature*. It seems that 'consequence' is what Grice calls 'the conventional meaning of the word[s]' *therefore*, which, in turn, 'will determine what is implicated'. The conventional implicature, then, is not 'consequence', as the authors referred to above suggest, and it is not tied to a single word, but rather to an expression built up from words with conventional meanings, arriving at the more 'fleshed-out' conventional implicature 'being brave is a consequence of (follows from) his being an Englishman'. In other words, whereas the word *therefore* conventionally adds the general meaning aspect of 'consequence' to the expression it is part of, the conventional implicature 'being brave is a consequence of his being an Englishman' is much more specific and tied to the expression as a whole. This resembles Karttunen and Peters's (1979a, p. 47) analysis, in which they explain how conventional implicatures (or, in their analysis, presuppositions) are tied to sentences. Karttunen and

Peters argue that a standard, declarative natural language sentence ϕ represents both ϕ^1, and ϕ^{P}, which stand for the sentence's truth-conditions and its conventional implicatures respectively, of which the latter are thus licensed at sentence level, not at word level (see also Gamut, 1991, p. 188).[47]

When we look at the pragmatic literature at large, it is clear that there are different ways of understanding the notion of conventional implicature, and in many cases, conventional meaning, as mentioned by Grice above, is not discussed at all. A perhaps remarkable observation is that Grice's brief passage on conventional implicature gets cited by a number of authors, but while it begins, as we saw above, by stating that 'in some cases, the conventional meaning of the words used will determine what is implicated, besides helping to determine what is said', hardly any author draws attention to the notion of conventional meaning. This is of importance, because for Grice, this meaning forms the basis for generating or licensing conventional implicatures. Although Potts (2005) is an exception by commenting on the excerpt explicitly, he does not clarify the issue. On the contrary, as we can see below, he argues that conventional implicatures are part of the conventional meaning of words.

> The phrase 'the conventional meaning of the words' is the crux of this statement, since it locates CIs [Conventional Implicatures] in the grammar. The 'conventional' part of 'conventional implicature' stands in for 'not calculable from the conversational maxims and the cooperative principle'. This is initial (and compelling) motivation for a dividing line between the phenomena that pragmatic principles should cover (conversational implicatures) and those that they cannot (CIs, among others). (Potts, 2005, p. 9)

He continues by asking whether it is 'true that the phrase mentioned places conventional implicatures in the grammar?'. I would argue, based on the same 'crux of this statement', that 'the conventional meaning of the words' is part of the grammar, but conventional implicatures are not. Rather, they are a product of the grammatical rules and words of a language combined. While one may object that this is reading too much into this passage, Potts's book *The Logic of Conventional Implicatures* (2005) deals, as the title suggests, specifically with conventional implicatures, and early on, Potts lists a number of properties of conventional implicatures, of which the first is 'CIs are part of the conventional meaning of words' (Potts, 2005, pp. 11, 88). Another example of the terminological problems at hand can be found in Chierchia and McConnell-Ginet's

[47] It must be noted, however, that later on, Grice (1989, p. 118) remains somewhat unclear on this issue by arguing that what is implicated 'may be either conventionally implicated (implicated by virtue of the meaning of *some word or phrase* [emphasis added] which he has used) or nonconventionally implicated (in which case the specification of the implicature falls outside the specification of the conventional meaning of the words used)'. I take this passage to be at least compatible with the distinction between conventional meaning and conventional implicature as made in this section.

discussion of the examples in (31) and (32) reproduced below, in which they argue that (32), but not (31) suggests 'that the speaker perceives a contrast between going to the store and buying nothing', while truth-conditionally (31) and (32) are identical.

(31) Jim went to the store and bought nothing. (Chierchia & McConnell-Ginet, 1990, p. 189)

(32) Jim went to the store but bought nothing. (Chierchia & McConnell-Ginet, 1990, p. 189)

They continue by arguing that 'considerations of this sort led Grice to regard the contrastive character of *but* as a "conventional implicature," an implication that is conventional in nature but not determinable by truth-conditional content as such'. However, such an explanation conflates word and sentence meaning. When one distinguishes between conventional meaning and conventional implicature, it must be the case that the conventional meaning of *but* includes 'contrast', but 'a contrast between going to the store and buying nothing' can only be a conventional implicature of the expression as a whole, with an important, but not exclusive contribution of *but*. Rather, the conventional meaning of *but* in unison with the other words in the sentence determines what is implicated. Blakemore (2002, p. 48) too seems to lump together conventional meaning and conventional implicature by arguing that 'it seems that Grice would want to say that the speech act whose performance is signalled by *but* or *on the other hand* in an utterance such as [(33)] has the content in [(34)], and hence that this is the conventional implicature carried by *but*'.

(33) My brother-in-law lives on a peak in Darien; his great-aunt, on the other hand, was a nurse in World War I. (Blakemore, 2002, p. 48)

(34) There is a contrast between the assertion that the speaker's brother-in-law lives on a peak in Darien and the assertion that his great-aunt was a nurse in World War I. (Blakemore, 2002, p. 48)

In fact, later in the discussion, Blakemore (2002, p. 72) mentions how 'we have already seen how the phenomenon [Grice] called *conventional implicature* – expressions such as *but* and *therefore*, for example – made it difficult for Grice to maintain this definition'. Next, Ariel (2010) shows how various scholars distinguish between truth-conditional and non-truth-conditional conventional meaning, while 'Grice's distinction between semantic meaning and conventional implicature hardly figures in linguistic problem solvers' analyses' (for references, see Ariel, 2010, p. 14). Later on, however, Ariel seems to use the terms conventional meaning and conventional implicature interchangeably, when she says that the 'contrast aspect of the interpretation of *but* is analyzed as a conventional implicature' (see also Ariel, 2008, pp. 69, 295). In analysing the example in (35) below, she mentions how the notion of contrast for *and* is

a conversational implicature, as it varies depending on the context, whereas 'it is a conventional implicature for *but*. Grice proposed a similar analysis for *therefore*'.

(35) I do not know if they sold or advertised, but we did not sell anything, no apartment and (a) week ago suddenly people came in, bought... (Ariel, 2010, p. 127)

Keeping the terminology clear, however, we should say here that the conventional meanings of *and* and *but* are different, and in case of *but*, its conventional meaning together with the other words and their order in the expression license a conventional implicature, which is more specific than 'contrast', namely a contrast between 'we didn't sell...' and 'possibly they sold'. It is of course possible that this is what Ariel means, but by using the terms 'conventional meaning' and 'conventional implicature' somewhat loosely, we lose an important distinction. This can be seen clearly in the following passage.

> So, the conventional implicatures associated with e.g., *moreover*, *anyway*, and *but* constitute **conventional** meanings which are not necessarily truth conditional. On the assumption that conventional meanings are semantic, these expressions contribute semantic meanings. Yet, these fail to impact the truth conditions of the propositions they occur in. They are semantic phenomena which pattern in a pragmatic manner. (Ariel, 2010, p. 64)

Here, the term 'conventional meaning[s]' seems to be used to refer to overall sentence meaning, while, in the same sentence, conventional implicatures are again directly connected to individual words. As Ariel (2010, p. 128) sums up, with respect to their context-independence, detachability, determinateness and non-cancellability, 'conventional implicatures are rather like semantic meanings'. I agree with this conclusion to the extent that conventional meanings, such as 'contrast' for *but* and 'consequence' for *therefore*, are indeed (non-truth-conditional) semantic meanings, but the respective conventional implicatures are more specific, and while they do not depend on context, they are licensed not only by individual words and their conventional meanings, but by the combination of words in the expression or sentence it appears in. It is thus conventional within the system of 'rules and words' (or constructions) of a language, but not part of the semantic meaning of a single word.[48] I do not adhere to the view

[48] Grice's (1989, p. 25) discussion of an example in which someone has uttered *He is in the grip of a vice* suggests, although it is not mentioned explicitly, that conventional meaning is not limited to words or phrases, but can also be attached to larger constructions. He argues that, 'given a knowledge of the English language, but no knowledge of the circumstances of the utterance, one would know something about what the speaker had said, on the assumption that he was speaking standard English, and speaking literally. One would know that he had said, about some particular male person or animal x, that at the time of the utterance (whatever that was), either (1) x was unable to rid himself of a certain kind of bad character trait or (2) some part of x's person was caught in a certain kind of tool or instrument (approximate account, of course)'.

expressed by Ariel (2010, p. 164) that 'conventional implicatures form part of the grammar, because their interpretation is encoded, no inferencing is needed in their generation'. This is, in Grice's view I believe, true for conventional meaning, but again not for conventional implicatures, which are licensed by specific words in their syntactic 'context' and must thus be inferred.

The question then remains to which extent conventional implicatures are pragmatic when defined in terms of inferences.[49] No context is needed for conventional implicatures, but in order to 'work them out', it seems some level of inferencing is involved, as one needs to combine both the conventional meanings of the words and knowledge of the grammar of English, because conventional implicatures are tied to sentences or expressions i.e., 'the elements of [the sentence], their order, and their syntactic character' (Grice, 1989, p. 87; see also the notion of 'Syntactic Correlation' introduced by Bach, 1999, p. 15). This view is, again, contrary to the view endorsed by Ariel (2010, p. 128) and the view by Levinson (1983) discussed earlier, who argue that conventional implicatures reside on the code side of the 'code/inference distinction', because, as Ariel argues, by their conventional status, they do not have to be inferred, while remaining implicatures due to their non-truth-conditional contribution to overall meaning. Related to this is Potts's (2007a, p. 668) warning against being 'misled by "implicature" in the label "conventional implicature". CIs are not pragmatic meanings'. However, if conventional implicatures are licensed by the conventional meanings of the words used and the order they are presented in, i.e., they arise at sentence level, they can be said to be calculated, or one would have to stipulate the expression as a whole as one indivisible unit, which is also what Horn (2008, p. 48) suggests: 'a Conventional Implicature of ϕ is an aspect of the meaning of ϕ that does not affect ϕ's truth conditions (i.e., does not affect what is said) but is part of the idiosyncratic lexical or constructional meaning of the expressions involved' (i.e., 'conventionally implicated material [...] constitutes part of the encoded meaning that is irrelevant to the truth conditions of the full sentence'; Horn, 2016, p. 1). With respect to the status of conventional implicatures, Horn (2008, p. 50) argues that it is semantic 'insofar as it involves an aspect of the conventional meaning of a given expression rather than being computable from general principles of rational behavior or communicative competence, but it is pragmatic insofar as it involves considerations of appropriateness rather than truth of the sentence in which it appears'. Carston's (1998, p. 24) remark on Grice's analysis of words like *but* and *therefore*, shows how they act as 'devices of conventional implicature, contributing to higher-level speech acts'. Such inferences are described in terms of 'procedural encodings' in the framework of Relevance Theory. Although the notion of conventional implicature has no place in this framework (see above), the explanation that linguistic elements such as the connectives *after all*, *so*,

[49]The problem of drawing the semantics-pragmatics distinction can be seen in action here, as it depends on what dimension is chosen (implicit/explicit, literal/non-literal, direct/indirect, truth-conditional/non-truth-conditional, conventional/context-dependent; see e.g., Ariel, 2010, Chapter 2; Bach, 2001, pp. 21–22).

and *but* 'indicate to the hearer what type of inference process he should perform in deriving the cognitive (contextual) effects of the propositions explicitly communicated by the utterance' is comparable to (although not identical with) the difference between conventional meaning (the meaning of words) and conventional implicatures (or 'cognitive (contextual) effects of the propositions').[50]

Some scholars are more explicit about the distinction between conventional meaning and conventional implicature. Gamut (1991, p. 215) for instance, argues that the contrast meaning of *but* is irrelevant to the truth of the proposition expressed, 'so we have here a non-truth-conditional aspect of conventional meaning. The corresponding implicature, that the speaker believes there is some opposition between the two conjuncts conjoined by *but*, is a conventional implicature'.[51] Recanati (1993, p. 233), in painting what he calls 'the Gricean picture', mentions that 'the meaning of the sentence also determines other, non-truth-conditional aspects of utterance meaning, like those responsible for the difference between "and" and "but". Grice calls them "conventional implicatures"'. In what follows, he contrasts conventional implicatures with conversational implicatures by arguing that the former are 'conventionally determined by the meaning of the sentence', whereas the latter are 'part of what the utterance communicates'. Gazdar (1979, p. 38), in discussing the examples reproduced in (36) and (37), argues that 'on the not implausible assumption that *but* carries a conventional implicature, examples [(36)] and [(37)] would have the same truth conditions and differ only in that [(37)] conventionally implicates a proposition involving some sort of contrast, unexpectedness, or the like'.

(36) Mary got pregnant and John was pleased. (Gazdar, 1979, p. 38)

(37) Mary got pregnant but John was pleased. (Gazdar, 1979, p. 38)

Although it seems Gazdar here conflates conventional meaning and conventional implicature, he continues by saying that the implicature (of contrast) 'arises solely because of the particular (non-truth-conditional) properties of the word *but* and cannot be given some higher-order explanation in terms of conversational rules', which means that it is indeed the conventional meaning of *but* that contributes to *licensing* a conventional implicature, but it does not embody it. As Gazdar describes it, 'the dictionary entry for *but* would have to have some pragmatic component that would specify its *implicature potential* [emphasis added]'. Perhaps more explicitly, Bach (1999, p. 327) distinguishes between conventional meaning and conventional implicature as well. In arguing against the notion of conventional implicature, he discusses how the common

[50] See also Ariel (2010, p. 69), who argues that 'conventional implicatures are considered pragmatic for Grice (e.g., the contrast associated with *but*), because they are nontruth conditional, regardless of their conventionality. But they are (linguistic) semantic for Relevance theoreticians, because they constitute coded meanings, their nontruth conditionality considered irrelevant'.

[51] Note however that 'some opposition' here would still refer to a general meaning, which is contrary to the view endorsed here.

view holds that the difference between his examples in (38) and (39), as reproduced below, 'depends essentially on the conventional meaning of the word "but"'.

(38) Shaq is huge but he is agile. (Bach, 1999, p. 327)

(39) Shaq is huge and he is agile. (Bach, 1999, p. 327)

In Bach's discussion, the contrast meaning of *but is* not a conventional implicature, but 'generates' one. In turn, Bach (1999, p. 331) defines conventional implicatures as follows.

> A proposition is a conventional implicature of an utterance just in case (a) the speaker (speaking seriously) is committed to the truth of the proposition, (b) which proposition that is depends upon the (or a) conventional meaning of some particular linguistic device in the utterance, but (c) the falsity of that proposition is compatible with the truth of the utterance. (Bach, 1999, p. 331)

We see here how conventional implicatures are defined in terms of propositions that result from utterances. While I distinguish between sentences or expressions and utterances, the point here is that combinations of words (sentences, utterances) generate conventional implicatures, not words in isolation. Words are, of course, important, but must be seen as devices 'to generate conventional implicatures'. Bach (1999, p. 333) calls these ACIDs ('alleged conventional implicature devices'), and he provides examples such as the adverbs *already*, *also*, *barely*, *either*, *only*, and *scarcely*, implicative verbs such as *bother*, *condescend*, *fail*, and *manage*, and subordinating conjunctions such as *although*, *despite*, and *even though*. This view is compatible with Zufferey, Moeschler and Reboul's (2019, p. 90) remark, who, in discussing the passage from Grice cited on page 45, argue that 'discourse connectives such as *therefore*, *because* and *but* trigger conventional implicatures because it is the meaning of connectives that leads to the derivation of the implicature'. For instance, in the expression in their example reproduced in (40), *even* plays an important role in triggering the conventional implicatures in (41) and (42), but these implicatures are ultimately implicatures of the sentence in (40), not merely of the adverb *even*.

(40) Even Bill likes Mary. (Zufferey, Moeschler & Reboul, 2019, p. 91)

(41) Other people besides Bill like Mary. (Zufferey, Moeschler & Reboul, 2019, p. 91)

(42) Of the people under consideration, Bill is the least likely to like Mary. (Zufferey, Moeschler & Reboul, 2019, p. 91)

Again, conventional meaning at word level licenses conventional implicatures at sentence or expression level (see also Sadock, 1978).

As conventionalisation of implicatures plays an important role in language change (see e.g., Traugott, 1999; Bach, 1998), the diachronic literature may help clarify some issues at hand. Schmid (2020, pp. 278–279) distinguishes between conventional meaning and conventional implicature in discussing the example in (43).

(43) Professor Jones was there. As you know, he talks a lot and so the meeting lasted six hours. (Schmid, 2020, p. 278)

Schmid argues that the conventional implicature 'Professor Jones was there. So the meeting lasted six hours' 'hinges upon the word *so*, which bridges the gap filled by the proposition *he talks a lot* in example [(43)]. The potential of *so* to act as such as a bridge derives from highly specific pragmatic associations connected to this particular form'. In turn, Schmid describes such conventional implicatures as 'highly specific routinized pragmatic associations connected to specific linguistic forms', which, although not as explicitly as may have been the case, seems to reflect the difference between (non-truth-conditional) conventional meaning and conventional implicatures. In a common view on language change, particularised conversational implicatures, if licensed frequently, become generalised conversational implicatures, and, in the end, may become conventional implicatures, as they become so entrenched that using a certain form invariably licenses the implicature at stake (see Traugott & König, 1991, Chapter 3). Levinson (1979, p. 213) argues as follows: 'In some limited domains one seems to be able to find a series of stages in the linguistic change: e.g., from particularized to generalized conversational implicature, then to conventional implicature, in the case of some conventionally encoded honorifics in Asian languages'. Although Levinson (1979, p. 216) later on asks (retorically), 'What could be more natural then than to call the end product of a process of conventionalization of conversational implicatures, conventional implicatures?', it remains to be seen how, in this view, the difference between word and sentence meaning can be maintained, as change from particularised to generalised conversational implicatures occurs at the same (sentence) level, but this cannot be said for the 'next step', as, in Levinson's view, and given his examples, conventional implicatures occur at word level. As this issue goes beyond the scope of this dissertation, I will not pursue it further here, apart from remarking that I would argue that the meaning aspect developed out of a conversational implicature would not (gradually) 'turn into' a conventional implicature, but instead become the conventional meaning of the form, especially in case of the examples central in most, if not all discussions on conventional implicatures, which are mostly words like *but* and *therefore*, and sometimes small phrases like *in fact* and *all in all*.

The question may very well have have risen by now why such a detailed discussion is of any importance to the analysis of conditionals. The preliminary answer to this question is that the conditional conjunction *if* has a conventional, truth-conditional meaning similar to $\rightarrow$. In the following sections, we will see it also has the conventional, non-truth-conditional meaning aspects of what I

will call 'unassertiveness' and of 'connectedness'. In other words, *if* in natural language is a conjunction that (invariably) carries the conventional meaning that its conjuncts p and q are not asserted (but suggested, echoed, questioned, et cetera), and that the conjuncts are in some way connected (as cause and effect, argument and conclusion, et cetera). These are conventional meanings (not conventional implicatures), in the same way 'contrast' and 'consequence' are conventional meanings of *but* and *therefore* respectively. This is, however, as we will see in what follows, where a comparison to the stock examples *but* and *therefore* ends, because the notions of unassertiveness and connectedness are more abstract than those of contrast and consequence. Before going into detail on unassertiveness and connectedness in the next sections, however, I will briefly summarise the discussion on non-truth-conditional meaning below.

2.4.7 Conclusion

In this section, I discussed how the term 'non-truth-conditional meaning' is used in this study. It should come as no surprise that we will use this term to approach two main discrepancies between the conditional in logic and in natural language we have discussed in the previous section: the knowledge of p being false, or q being true rendering any conditional statement true, and the irrelevance of a connection between p and q in the analysis of conditionals as material implication.

As far as non-natural meaning goes, words have conventional meanings. These meanings may contribute to the truth-conditional meaning of the expression they are used in, the non-truth-conditional meaning, or both. In case of *therefore*, for instance, which was discussed above and is one of the stock examples in the pragmatic literature on the subject, its truth-conditional meaning is $\wedge$, whereas its non-truth-conditional meaning is 'contrast.' When combined with other words, and as a result forming, in this case, a compound sentence, such as 'He is an Englishman; he is, *therefore* brave', the sentence, including but not limited to *therefore*, licenses a specific conventional implicature, here 'his being brave is a consequence of his being an Englishman' (cf. Grice, 1989, pp. 44–45). Whereas conventional meanings are thus tied to words, conventional implicatures are tied to sentences (or expressions). As we will see in the following sections, the two meaning aspects of conditionals that are central in this dissertation, namely unassertiveness and connectedness, will be analysed as conventional meanings, not as conventional implicatures. They may, however, give rise to conventional implicatures, although we will see this is probable for only one specific type of conditional.

The goal of this discussion was provide terminological clarity. I use the term 'non-truth-conditional meaning' to refer to those parts of meaning that are not the result of logical operators and the individual proposition(s) they operate on. Rather, the evaluation of what counts as non-truth-conditional meaning requires additional information, such as information that is conventionally attached to a word but not to its 'logical pendant', information conveyed by the

order of the words in a sentence, or information attached to the use of an expression in a certain context (i.e., the utterance). While this is an attempt at a clear description of 'non-truth-conditional meaning', matters are, of course, more complex. As Dancygier and Sweetser (2005, p. 41) argue, 'not only is the boundary between semantics and pragmatics a fuzzy one, but all added implicatures of linguistic usage (whether more or less conventional) are initially cued by the most conventional aspects of meaning, the ones we most comfortably label "semantic"' (for similar views, see e.g., Wierzbicka, 1988, pp. 1–20; Langacker, 2008, p. 40). While I will try to analyse the non-truth-conditional meaning of conditionals as those aspects of meaning which cannot be captured in the propositions they present, in terms of logical operators, this must be seen in light of being clear on terms, not in order to strictly hang on to a sharp distinction between semantics and pragmatics. This is in line with a recent call by Leclercq (2020, pp. 227–231) for 'more terminological precision' concerning the notions of semantics and pragmatics in the framework of construction grammar by distinguishing between 'conventional and non-conventional aspects of meaning' and 'truth-conditional and non-truth-conditional aspects of meaning'. We will explicitly come back to this at the end of this chapter in discussing the specified research questions in this dissertation. For now, the distinction between truth-conditional and non-truth-conditional meaning must be seen foremost as a clear starting point for further analysis.

2.5 Unassertiveness of conditionals

2.5.1 Introduction

In this section, I focus on the first problem discussed in section 2.3. In short, the problem is that a false proposition p presented in the antecedent renders any conditional true, regardless of the truth of proposition q presented in the consequent. I will address this issue by arguing that the problem does not occur in natural language. This may seem like a blunt statement, but I will use this section to argue that language users would not use a conditional in situations in which they could assert p. I will thus argue for the unassertiveness of conditionals, instead of their alleged *uncertainty*, as in Strawson's claim that, by using a conditional, the speaker's utterance 'carries the implication' of uncertainty about or disbelief in p and q (Strawson, 1952, p. 88; see also Grice, 1989, p. 9).[52]

[52]For similar views in different frameworks, and with varying views on semantics and pragmatics, (e.g., Comrie, 1986, pp. 79, 89; Sweetser, 1990, p. 141; Dancygier, 1998, p. 72; Huddleston & Pullum, 2002, p. 741; Gabrielatos, 2019). see also section 5.5 on modality.

2.5.2 Uncertainty, hypotheticality and unassertiveness

In most pragmatic accounts, the hypotheticality or, in Levinson's (2000, p. 110) terms, 'epistemic uncertainty' expressed by using a conditional is considered a conversational implicature. This analysis is based on contrasting the use of conditional *if* with the use of a factive conjunction like *since*. In other words, the implicature is derived as a clausal implicature as defined by Levinson (1983) (based on Gazdar, 1979, pp. 60–61) in (44) below.

(44) Clausal implicature

If S asserts some complex expression p which (i) contains an embedded sentence q, and (ii) p neither entails nor presupposes q and (iii) there's an alternative expression r of roughly equal brevity which contains q such that r does entail or presuppose q; then, by asserting p rather than r, S implicates that he doesn't know whether q is true or false, i.e., he implicates $\mathrm{P}q$ & $\mathrm{P}\sim q$.[53] (Levinson, 1983, p. 136)

This means that a speaker violates Grice's Maxim of Quantity, and more specifically, its first sub-maxim ('Make your contribution as informative as is required'), by using a conditional ('complex expression p') in a situation in which she actually holds a belief about (the truth value of) either of these propositions, because a conditional does not presuppose or entail the embedded propositions. Gazdar presents the following argument.

> IF one utters a compound or complex sentence having a constituent which is not itself entailed or pre-supposed by the matrix sentence and whose negation is likewise neither entailed nor pre-supposed, THEN one would be in breach of the maxim of quantity if one knew that sentence to be true or false, but was not known to so know, since one could have been more informative by producing a complex sentence having the constituent concerned, or its negation, as an entailment or a presupposition. It follows that, ceteris paribus, the utterance of such a complex sentence implicates that both the constituent sentence and its negation are compatible with what the speaker knows. (Gazdar, 1979, pp. 60–61)

A speaker could and thus should have been more informative by using a complex expression ('alternative expression' r) or its negation that does entail or presuppose the truth value of the embedded proposition. If there is an alternative to using a conditional that is of 'roughly equal brevity' (cf. Grice's *maxim of Manner*; see also Gazdar, 1979, p. 61; Levinson, 1983, p. 135) that indeed presupposes the embedded propositions, the speaker would have been more informative in using that expression. If she did not, the addressee is entitled to infer that the speaker does not know whether or not the embedded propositions

[53] Here, 'P' stands for 'any declarative sentence expressing the proposition p' (Levinson, 1983, p. 123). In this notation, ~ stands for negation (¬).

are true (or, in Gazdar's (1979, p. 61) words, both the embedded propositions and their negation are 'compatible with what the speaker knows'), as in (45) below.

(45) If the cat returns before dinner, we don't have to look for it tonight.
$Qn_1+>$ 'The cat may or may not return.'[54]

Clausal implicatures work like Horn scales (cf. Horn, 1972, 1984).[55] Such a scale of expressions is organised by informativity, such as <*all, most, many, some, few*> and <*and*, *or*>. In these scales, the higher items are more informative and entail the lower items. Although lower items on a scale, such as *most*, are truth-conditionally compatible with higher items such as *all*, when using *most* the speaker provides grounds for the inference that she was not in a position to use *all*, as this would amount to a breach of the maxim of Quantity. For instance, saying you have 'most of the money' is compatible with saying you have 'all of the money', but as the latter is more informative, using *most* generates the implicature that *all* does not apply (i.e., one who says 'I spent most of the money' did not, technically speaking, tell something untrue when it turns out she spent 'all of the money'). The same effect can be seen by contrasting (45) with (46) below.

(46) Since the cat returns before dinner, we don't have to look for it tonight.
~~$Qn_1+>$ 'The cat may or may not return.'~~

Here 'since p, q' entails both p and q, whereas 'if p, q' in (45) does not. Hence, the implicature of not knowing the truth value of p and, in effect, that of q, is licensed through the first sub-maxim of Quantity in (45),[56] but not in (46). It is thus an inference 'from the lack of informational richness to the speaker's inability to provide it' (Levinson, 2000, p. 116). Huddleston and Pullum (2002, p. 741) provide the same explanation in terms of informational strength (see section 3.2.9), in the sense that *if p, q* is weaker than *p and q*. Using a non-factive conjunction in situations where one knows p to be true or false, would be considered 'conversationally inappropriate' (cf. Forbes, 1994, p. 84).

Let us return to the problem at hand: any false p or true q renders '$p \rightarrow q$' true. While Levinson (2000, p. 110) calls the inference discussed above an implicature of 'epistemic uncertainty', I will argue for the term 'unassertiveness' to tackle the problems associated with the theorems as listed by Strawson (1952). The clausal implicature defined above predicts that, given the truth or falsehood of either p or q, a cooperative language user (i.e., a language user following the Cooperative Principle) would not use a conditional, because using a conditional implicates p being either true or false, and q being either

[54] $Qn_1+>$ here denotes 'implicates through the first sub-maxim of the maxim of Quantity'. Symbols for implicatures are based on the symbols used in Levinson (2000, pp. xi–xii) and Huang (2017, p. 13).

[55] For an application to conditionals, see also Huang (2009) and Levinson (2000, pp. 19–20).

[56] Or in Levinson's (2000, p. 36) account, the first Q-heuristic: 'What you do not say is not the case'.

true or false ($(P \vee \neg P) \wedge (Q \vee \neg Q)$). This shows why the theorems in (20c) and (20d) repeated below are problematic in the material analysis of natural language conditionals, but not in actual conversation.[57]

(20c) $Q \supset (P \supset Q)$

(20d) $Q \supset (\neg P \supset Q)$

While I argue above that natural language conditionals conforming to the theorems in 2.5.2 should not occur without additional inferences, in cooperative communication, remarkably, examples of such uses can be found, when one accepts 'pragmatic' or 'speech-act conditionals' as conditionals (see also section 2.2). In Sweetser's example in (47) below, for instance, or in Austin's famous example in (48), the antecedent relates to the consequence on the pragmatic or discourse level.

(47) If I may say so, that's a crazy idea. (Sweetser, 1990, p. 118)

(48) There are biscuits on the sideboard if you want them. (Austin, 1970, p. 212)

In these examples, the consequent is used as a speech act irrespective of the truth value of p. Following the second sub-maxim of Quantity in (29) ('do not make your contribution more informative than is required'), a speaker uttering either (47) or (48) could also only have uttered the consequent. However, the antecedent 'merely' contextualises the speech act performed by uttering the consequent and serves as a remark in the interest of politeness. In other words, the truth value of q seems independent of the truth value of p and, especially in (48), q seems to be asserted irrespective of p. This seems to be the only use of a conditional for which the theorems above do not pose problems. These examples do not pose problems for the pragmatic account presented above either, as p is still not asserted, as this would defeat its use as a politeness strategy.

Now, one could ask why we need to distinguish between unassertiveness, uncertainty and hypotheticality. The reason for this is that the unassertiveness of conditionals in natural language does not seem to be context dependent, which would be expected if we were to treat it as a conversational implicature, even a strongly generalised one, which is calculable as explained above. The unassertiveness of conditionals, however, cannot be a conversational implicature, as the scale on which the implicature would be based, is itself based on the conventional, albeit non-truth-conditional, meaning of *if*. Without the unassertiveness tied to the form of a conditional, there would be nothing to suggest that *if* is less informative than *since*. A speaker chooses the conditional form not because she is necessarily uncertain on the truth of proposition p, but because she cannot or does not want to commit herself to p. This suggests unassertiveness to be a conventional meaning of conditionals (see section 2.4.6 above on the terms

[57] Note that this does not confound analysis and use, as the argument here is that the problematic theorems do not correspond to any actual conversational situation.

'conventional meaning' and 'conventional implicature'), and I will argue that it is, although such an analysis may seem to run into problems quickly. Of those problems, the first problem is the use of conditionals in contexts in which p is known to be true. The second problem is that some conditionals are said to be 'counterfactual', i.e., to express the falsity of propositions p and q. As it turns out, these problems can be overcome and I will use them to develop the notion of unassertiveness as a conventional meaning aspect of conditionals in more detail. I will start by addressing the first problem in the next section.

2.5.3 Unassertiveness and givenness

The first problem at hand is the use of a conditional in contexts in which the truth of p is given. In line with the previous section, we should be able to answer the question why a language user would opt for the less informative conditional when a factive conjunction can be used.

Bennett (2003, p. 4) starts out his study of conditionals by defining a conditional as an 'item expressible in a sentence of the form "If [sentence A], then [sentence C]", the effect of the whole being to apply a binary operator to propositions expressed by those two contained sentences' (see the material analysis discussed in section 2.3). He argues that this definition helps capture 'obviously genuine conditionals', while a 'deeper account can emerge from the analysis (or analyses) that we eventually come up with', a practical approach similar to the aim of section 2.2. He explicitly excludes the example in (49) below (adapted from Akatsuka, 1985 by Bennett).[58]

(49) If you have applied, I'm going to apply too. (Bennett, 2003, p. 5)

The fact that the truth of p is contextually given, as can be seen in Akatsuka's original example below in (50).

(50) A: I'm going to the Winter LSA.
B: If you are going, I'm going, too. (Akatsuka, 1985, p. 635)

In Stalnaker's (1968) account, the 'givenness' of p as in (50) above would be 'merely' a pragmatic component of the concept of conditionals, leaving in tact the possible worlds theory of conditionals in which belief conditions are transferred into truth values. Although the frameworks differ, this comes close to Dancygier's (1998, p. 19) remark that 'the presence of *if* requires an interpretation under which the assumption in its scope does not count as an act of assertion'. This may seem to conflict with the example in (50), but it does not. If the antecedent of B's conditional would merely repeat the assertion made by A, B would violate the second maxim of Quantity, or one of the preparatory felicity conditions of assertions, i.e., that speaker and hearer do not both know that the hearer knows the truth of p (cf. Searle, 1969, p. 65). Rather, the

[58] Bennett does not provide a page number and the exact example was not found in Akatsuka (1985). This example most closely resembles the one provided by Bennett.

antecedent does not count as an assertion, and the repetition of A's utterance in the form of an antecedent should be analysed not in terms of violating the maxim of Quantity, but as obeying the maxim of Relation, as the antecedent here serves to provide the grounds for the conclusion in the consequent (but see section 2.6). The example in (50) may then be an example to show that not all conditionals are used to express uncertainty, but it is not a counterexample to the unassertive conventional meaning of conditionals with respect to the individual propositions (see the notion of *unassertability* in Horn, 1989, p. 378; see also Dancygier, 1998, pp. 19, 103, 121; Rieger, 2015). I argue here that unassertiveness, and not uncertainty or hypotheticality, is a non-truth-conditional, yet conventional part of the meaning of conditionals. Levinson, however, argues that there are situations in which the unassertiveness of conditionals is cancelled, and he opts for a conversational approach. According to Levinson (2000, pp. 11, 109), the 'epistemic noncommittedness' of conditionals is a generalised conversational implicature, i.e., a '*default* inference [emphasis added]', and conversational implicatures are to be defeasible. He provides the example in (51) below.

(51) If Chuck has got a scholarship, he'll give up medicine. (Levinson, 1983, p. 142)

Levinson (1983, p. 142) argues that to utter (51) is 'to implicate that one does not have any reason to think that Chuck has actually already got a scholarship or to think that he will definitely give up medicine'. However, given the right context, this implicature can be cancelled, as we can see in (52).

(52) A: I've just heard that Chuck has got a scholarship.
B: Oh dear. If Chuck has got a scholarship, he'll give up medicine. (Levinson, 1983, p. 142)

Levinson provides this example to show that the inference from B's use of a conditional in (52) to uncertainty about the antecedent is an implicature. Given this context, Levinson argues the 'the clausal implicatures [to] evaporate,' and he concludes that it cannot be a non-defeasible aspect of the meaning of conditionals. Levinson (1983) argues for 'hypothetical implications associated with the use of *if ... then*', while Levinson (2000) argues that 'these implicatures capture the inference of epistemic noncommittedness associated with the conditional [...]'. Hypotheticality and non-committedness or *unassertiveness*, however, are different notions, as we will see shortly. Huddleston and Pullum (2002) too argue for a conversational implicature. They give the example of (53) below, which can be uttered in a context in which it has just been established that 'she bought it at such-and-such a price'.

(53) If she bought it at that price, she got a bargain. (Huddleston & Pullum, 2002, p. 741)

Huddleston and Pullum (2002, pp. 741–742) argue that 'my not knowing whether P is true or false is an implicature, not an entailment' because one can use a conditional in contexts where 'P has just been asserted or established'

without contradiction. In a case such as (53), a conditional is used to explain the inference expressed in the consequent as being drawn from the antecedent. To disentangle this issue, we turn to Akatsuka (1986), who argues, albeit in other terms, that it is not needed to deem the unassertability of conditionals an implicature when the difference between knowledge and (newly learned) information is taken into consideration:

> It is impossible for anyone to enter other people's minds and directly experience their feelings, emotions or beliefs. What is registered in their mind now is only indirectly accessible to us as 'information' through observations of external evidence, including linguistic communication. (Akatsuka, 1986, pp. 340–341)

Akatsuka argues that the difference between 'unsharable' knowledge and information reflects why conditionals can be used even when p is (contextually) given. If one regards a proposition to be true, but the proposition concerns newly learned information rather than knowledge coming from direct observation, it can be used in the antecedent of a conditional.[59] Akatsuka provides the following examples.

(54) Son (looking out of the window):
It's raining, Mommy
Mother: If it's raining (as you say), let's not go to the park. (Akatsuka, 1986, p. 341)

(55) Son (looking out of the window and noticing the rain):
$*$ If it's raining, let's not go to the park![60] (Akatsuka, 1986, p. 341)

The contrast between (54) and (55) shows that contextually given information, and not knowledge gathered from direct experience, can be used as the antecedent of a conditional. As Dancygier (1998, p. 187) argues: 'the assumption brought up in the protasis may simply be observable in the immediate environment; it may have been communicated by another participant [...]'. If the unassertiveness were a (generalised) conversational implicature and not part of the meaning of a conditional, the example in (55) would have to be felicitous. If, however, the unassertiveness of conditionals *is* part of the (conventional, non-truth-conditional) meaning of conditionals, it would conflict with the direct observation that results in knowledge, as it indeed does in (55). The same goes for Huddleston and Pullum's example; the person uttering (53) cannot have just witnessed someone buying the product, but has to have learnt this information indirectly. In other words, *if* construes a situation as not directly jointly

[59] See also Goebel (2017, p. 382) for an similar analysis of biscuit conditionals in terms of knowledge and common ground, and the experiments by Krzyżanowska, Collins and Hahn (2020) on 'source reliability' in learning from testimonies in the form of indicative conditionals, as in *If Bill has malaria, then he will make a good recovery.* (Krzyżanowska, Collins & Hahn, 2020, p. 987; see also Hartmann & Hahn, 2020).

[60] Please note that the $*$ judgment is Akatsuka's.

observable in the communicative situation. This shows that it is not necessary, as Levinson (2000) argues, that claiming that 'hypothetical implications were built into the semantics of the conditional' would amount to rendering *if* ambiguous.[61] We do not want to claim hypotheticality, but unassertiveness as part of the 'semantics of the conditional'. A contextually given p can be hypothetical, but it does not have to be in order to be used as the antecedent of a conditional.[62] Furthermore, Athanasiadou and Dirven (1996, 1997a) show that hypotheticality is a prototypical feature of a certain type of conditionals (see section 3.3.9 for detailed discussion), but not of all conditionals. In their example, adapted in (56) below, for instance, the relation between antecedent and consequent is co-occurring and the antecedent is, in their terms, 'factual'.

(56) If there is a drought like this year, the eggs remain dormant. (Athanasiadou & Dirven, 1996, p. 62)

A perhaps clearer example is the 'general hypothetical' in (57) below.

(57) If ice is left in the sun, it melts. (Strawson, 1952, p. 88)

Although Strawson (1952, pp. 88–89) calls this a 'general hypothetical', he uses the term 'hypothetical' for 'conditional' in the sense that the antecedent 'would be a good ground or reason for accepting the consequent'. The point here is that the situation expressed in the antecedent is general and not 'uncertain' or 'hypothetical'. It is, however, unasserted, as the speaker did not commit herself to any specific occurrence of ice being left in the sun. Like with 'particular conditionals' (as opposed to the 'general conditionals' above), there may be hypotheticality or uncertainty involved, but the unassertiveness of the conditionals remains constant.

While I agree with Levinson (1983, 2000) that 'epistemic uncertainty' may be a generalised conversational implicature and thus defeasible, I argue here that *unassertiveness* is part of the non-truth-conditional, conventional meaning of conditionals. By using a conditional, a speaker does not assert any of the individual propositions. Rather, the unassertiveness of conditionals is part of their *conventional meaning*, i.e., the non-truth-conditional part of linguistically coded meaning (see Levinson, 2000, pp. 14, 166). Applied to the examples in (54) and (55) previously discussed, we can now see why the latter, analysed in (59) below, is infelicitous: the direct observation of the son is incompatible with the conventional meaning, which is non-cancellable, in contrast to a conversational implicature.

[61] This view has remained unchanged in Levinson (2000).

[62] It may be said however that the acceptance of p is hypothetical – see 'as you say' in (54).

(58) Son (looking out of the window):
It's raining, Mommy
Mother: If it's raining (as you say), let's not go to the park.
$\widehat{\approx}$ p is not asserted.
$+>$ 'It may or may not be raining.'[63]

(59) Son (looking out of the window and noticing the rain):
$*$ If it's raining, let's not go to the park!
$\#$ $\widehat{\approx}$ p is not asserted.
$\#$ $\widehat{\approx}$ 'It may or may not be raining.'

What we may seem to lose in this approach is the scalar analysis in terms of *if* being part of the Horn-scale $<$*since, if*$>$, because conventional meaning is, by definition, non-calculable. Note however, how the conventional meaning ($\widehat{\approx}$) of unassertiveness in turn licenses the implicature ($+>$) of uncertainty.[64] However, as I argued before, we can view the scale as being based on the unassertiveness of conditionals, from which further implicatures of uncertainty or disbelief may result. Note here that I consider unassertiveness an aspect of conventional meaning, not a conventional implicature or presupposition. The difference between conventional meaning and conventional implicatures was discussed in detail in the previous section. The notions of conventional implicature and presupposition are closely related, but the exact differences are hotly debated. While this discussion falls beyond the scope of this dissertation, I would like to remark that I analyse unassertiveness in terms of conventional, non-truth-conditional meaning, because such meaning, by definition, has no bearing on truth conditions, whereas this is different for presuppositions, as in their failing, they either prevent the proposition expressed by the sentence containing the presupposition from having a truth value (cf. Russell, 1905; Strawson, 1952, p. 178), or render the proposition false (cf. Frege, 1948).[65] In contrast, a conventional implicature (per Grice's definition) does not have an effect on truth values.[66] I will briefly come back to this issue in the analysis of unassertiveness and counterfactuality in section 2.5.4. [67]

[63] As is the case with conversational implicatures, this implicature too is inderterminate (Grice, 1989, pp. 39–40), and could also be phrased as 'I am uncertain about it raining,' or 'I do not know whether it rains'.

[64] Although Grice (1989, p. 39) himself already suggests that 'it may not be impossible for what starts life, so to speak, as a conversational implicature to become conventionalised, to suppose that this is so in a given case would require special justification' (see also Grice, 1989, pp. 24–25, 43), we do not need to resort to such explanations.

[65] For overview and discussion of the larger debate on presupposition and presupposition failure, see Beaver (1997), Geurts (1999, Chapter 1), Beaver and Geurts (2014), Birner (2013, pp. 147–148).

[66] See Grice (1989, pp. 25–26, 43), Potts (2005, Chapter 3), and Kapsner (2020, p. 14).

[67] For a more elaborate account on conventional implicatures in general, see Potts (2005, Chapters 2, 3).

To tackle one more problem with the analysis of unassertiveness as conventional meaning, we will look at rhetorical conditionals (Quirk et al., 1985, cf.) (see section 3.3.4), as in (60), which may be thought of as a counterexample to the conventional status of unassertiveness.

(60) If that is Princess Anne, I'm a Dutchman. (Huddleston & Pullum, 2002, p. 742)

However, here too there is no assertion of proposition p and if there is an assertion, it is not by means of the antecedent. In line with Huddleston and Pullum's view, we see here that the clear falsehood of q gives rise to the implicature that p is false too. While, as Dancygier (1998, p. 19) argues, the reasons for not asserting may differ per conditional, 'the role of *if* as a signal of non-assertive meanings remains constant' (see also Dummett, 1973, pp. 328–330; Horn, 1989, pp. 377–379; cited by Dancygier, 1998, p. 19), even in rhetorical conditionals.

The conventional meaning of unassertiveness of conditionals licenses a (conversational) scalar implicature concerning the stance of the speaker towards p. Applied to the earlier examples in this section, we see that this analysis can accommodate for contexts in which there is no prior knowledge of p, as (61), as well as for contexts in which there is, as in (62).

(61) A: I've just heard that Chuck has got a scholarship.
B: If Chuck has got a scholarship, he'll give up medicine.
$\widehat{\approx}$ p is not asserted.
$\mathrm{Qn}_1+>$ 'I have reasons for believing Chuck has got a scholarship.'

(62) If the cat returns before dinner, we don't have to look for it tonight.
$\widehat{\approx}$ p is not asserted.
$\mathrm{Qn}_1+>$ 'The cat may or may not return.'

Here we see the constancy of the unassertiveness, and the dependency on context of the uncertainty implicature. This is compatible with the fact that conditionals are grouped together with other 'nonassertive contexts', such as questions and comparative clauses (see e.g., Quirk et al., 1985, p. 784) licensing negative polarity items (see van der Wouden, 1994, p. 132; Hoeksema, 2012, p. 17).[68]

The unassertive character of conditionals has also been described in terms of their 'non-veridicality' meaning, in Giannakidou (1998, p. 131) terms,, that conditionals express 'weakened commitment' towards proposition p expressed in the antecedent. For a more recent account, see Liu (2019b), who discusses the non-veridicality of conditionals in terms of the following commitment scale.

(63) More committed <BECAUSE p, IF p >Less committed.[69] (Liu, 2019b, p. 3)

[68]This view is also corroborated by extensive corpus studies, such as Gabrielatos (2010, 2021).

[69]Here, *because* is comparable to *since* in Levinson's account discussed above.

Although Liu does not relate this scale to Gazdar's (1979) clausal implicatures discussed above, they seem compatible, and they seem to express, in basic terms, the same idea, namely that the antecedent of a conditional is not used to assert p or express full commitment towards p.[70]

In conclusion, the choice of using a conditional conjunction rather than a factive conjunction may be due to an expression of uncertainty, indirect knowledge (see section 2.5.3), hypotheticality, contrast to expectations (see section 2.5.4), disbelief or some other stance towards p. Whereas these more specific stances towards p are conversationally derived from the fact *that* a conditional was uttered (i.e., why did the speaker use a conditional), unassertiveness remains constant and is tied to *what* was uttered (i.e., the speaker did not make an assertion of p and q).[71] Before drawing conclusions on this issue, however, we have to address another problem that was encountered in section 2.3.3, namely those conditionals which involve antecedents that present a proposition p as counterfactual.

2.5.4 Unassertiveness and counterfactuality

The second problem with unassertiveness as conventional meaning we identified in section 2.5.2 was the use of a conditional to express the falsity of p in subjunctive or 'counterfactual' conditionals, as in the example below.

(64) If the rain would have stopped, we would have been dry.

As a working definition of counterfactual conditionals, I follow Ippolito (2013, pp. 1–2) in taking counterfactuals to be subjunctive conditionals in which the temporal morphology 'is not interpreted as locating the eventuality described in the antecedent clause in time', but to signal an 'irrealis flavour', i.e., 'a proposition that the speaker does not judge to be very likely' or false.[72] Note however that a characterisation of subjunctive conditionals in terms of counterfactuality essentially discusses a morphological concept in semantic terms. Indeed, the terminology concerning counterfactuals is, as von Fintel (2011, p. 1517) calls it, 'linguistically inept', as it conflates morphological marking (tense, aspect) with mood (indicative, subjunctive). The term 'subjunctive conditional' is widely used to refer to counterfactuals, especially when contrasted with indicative

[70] See also the recent experiments by Liu, Rotter and Giannakidou (2021), who show that *falls* 'if/in case'-conditionals reduce speaker commitment about p in comparison to *wenn* 'if'-conditionals and V1-conditionals.

[71] See also Sorensen (2012, p. 825) on the difference between lying with conventional implicatures and misleading with conversational implicatures.

[72] Interestingly, counterfactuals dealing with 'alternative histories' (e.g., 'What if Germany had won the First World War?') are heavily debated among historians. Carr (1986, p. 91), for instance, argues that counterfactuals play 'a parlour game with the might-have-beens of history' and have nothing to do with history. They are consequently rejected as serious attempts at historical research. In discussing 'historical counterfactuals' Nolan (2013) however, provides several reasons why such 'alternative histories' may prove useful, such as reasoning about causation, and assessing responsibility for actions.

conditionals. In this section, and in line with the usual practice, when using the term 'subjunctive', I refer to a type of conditional distinguished in the literature from another type, namely indicative conditionals. In short, in past tense indicative conditionals, tense is used in a temporal sense to refer to the past, whereas in counterfactuals, the past tense is used in a modal sense to distance the speaker from the truth of p. Because of this, the use of tense in counterfactual conditionals is also called 'fake tense' in a number of accounts, marking 'hypotheticality, unexpectedness, or distance from reality' (see Iatridou, 2000; Schulz, 2014; Mackay, 2015).[73] In discussing verb tense in chapter 5 (see section 5.4), I will come back to this point to avoid terminological confusion. In that section, I will not use the term 'subjunctive' to refer to a type of conditional, and neither will I use the term to refer to a mood, as Dutch uses tense rather than mood to indicate counterfactuality.

In counterfactuals, p is taken to be false, and we can see in the relevant theorems from (20) repeated below that in this case, q can take both $\top$ and $\bot$ without rendering the conditional as a whole false.[74]

(20a) $\neg P \supset (P \supset Q)$

(20b) $\neg P \supset (P \supset \neg Q)$

We already saw this in the truth table of '$P \supset Q$' (see Table 2.1 on page 29), and we noted that in natural language, we would tend to be indecisive on the truth of the conditional as a whole (cf. the 'defective truth table' in Table 2.2 on page 33). As can be seen in the examples provided by Adams below, the indicative conditional in (65) implicates that either p nor $\neg p$ is be true, whereas its counterpart in (66) seems to express disbelief in or falsity of the antecedent (i.e., $\neg p$), rendering the conventional meaning of unassertiveness questionable.[75]

(65) If Oswald didn't kill Kennedy, someone else did. (Adams, 1970, p. 90)
$\widehat{\approx}$ p is not asserted.
$\mathrm{Qn}_1{+}{>}$ 'Oswald may or may not have killed Kennedy.'

(66) If Oswald hadn't killed Kennedy, someone else would have. (Adams, 1970, p. 90)
...

[73] Note that the basic meaning of tense can be seen as either time-based, or including time and other dimensions (such as realis-irrealis). For overview and discussion, see Boogaart and Janssen (2007).

[74] The theorem in (20e) is not repeated here, because it is a restatement of (20a) and (20b) combined.

[75] The minimal pair in (65)-(66) is now widely known as the *Oswald/Kennedy minimal pair* (see e.g., McDermott, 1999, p. 294; Edgington, 2008, p. 6; von Fintel, 2012, p. 466). However, Adams's (1970, p. 70) original examples were 'If Oswald hadn't shot Kennedy in Dallas, then no one else would have' and 'If Oswald didn't shoot Kennedy in Dallas, then no one else did' (see also Ippolito, 2013, p. 141).

The question then is whether the conventional meaning of *if* holds too for (66), and which implicature(s) it licenses. As may be expected from the previous section, I will argue that the conventional meaning stays in tact, and that it is the conversational implicature that differs between (65) and (66), i.e., counterfactuality is not a conventional part of the meaning of subjunctive conditionals (see also Dancygier & Sweetser, 2005, p. 71). Treating this generalised conversational implicature as conventional would be either incompatible with indicative conditionals as discussed before, because being unassertive on p and asserting falsity of p are incompatible, or it would suggest indicative and subjunctive conditionals to be different constructions.[76]

According to von Fintel (2012, p. 469), and contrary to what lines 3 and 4 of Table 2.1 suggest, the falsity of the antecedent in (66) leads to the acceptance of the consequent, as it 'amounts to saying that there were facts in the actual world that would have led to Kennedy's assassination one way or the other'. In case p is false, the truth table gives no prediction about q – the truth value of q is undetermined and $\neg p$ is compatable with both lines 3 and 4 of Table 2.1 – while (66) seems to license the truth of q. As von Fintel (2011, p. 1522) remarks, for indicative and subjunctive conditionals 'it is very commonly held that quite different approaches are appropriate'. This means that subjunctive conditionals generally receive another analysis than indicative conditionals (Karttunen, 1971, see e.g., Kempson, 1975; Ippolito, 2013; Williamson, 2020, especially Chapter 10; for a recent overview and discussion, see Edgington, 2020). This choice is motivated by the difference in temporal morphology (see the difference between (65) and (66) above). In other words, the difference in form between indicative and subjunctive conditionals licenses a different approach.[77] The evaluation of both types of conditionals need not be different, however.

Stalnaker (1975) argues for a truth-conditional semantics that covers both indicative and subjunctive conditionals. Indicative conditionals present antecedents that are within the 'context set', or the set of possible worlds which are compatible with the current conversation. Conversely, subjunctive conditionals are used when the speaker does not want to signal this compatibility, but when the speaker wants to signal compatibility with 'the nearest world' which

[76] As it is not necessary for the matter of unassertiveness under current discussion, we will return to the subject of indicative and subjunctive conditionals in sections 5.4 and 5.5, and briefly on the topic of their status as different constructions in section 6.5.

[77] This leads to another problem, namely that there are counterfactuals which are not subjunctive. The problem in this case is that the conditional has the indicative mood, but functions as a counterfactual, because one of the propositions is 'patently absurd' (Quirk et al., 1985, p. 1094). This falsity is carried over to the other proposition, as in their example in (a) below. I will argue for a unified pragmatic analysis, I will not discuss this matter further, apart from suggesting that this 'carrying over' may be analysed as a conversational implicature.

(a) If they're Irish, I'm the Pope. (Since I'm obviously not the pope, they're certainly not Irish.)

is presupposed to differ precisely on the matter of what is expressed in the antecedent (cf. Horn, 2000, p. 321). In this sense, (66) would mean that, apart from Oswald killing Kennedy, there were circumstances that would have led to Kennedy's assassination. A similar analysis can be found in mental spaces theory. Fauconnier (1994, p. 109) argues that 'counterfactuality is a case of forced incompatibility between spaces'. Conditionals are analysed as 'space builders' which, in the case of counterfactuals , open a cognitive structure by means of tense, as 'directly contradicting a reality that is known and cannot be changed' (Dancygier & Sweetser, 2005, p. 76).[78] The incompatibility with the 'nearest world' or the 'base [reality] space' is derived from the temporal morphology in the 'contrary to fact' antecedent, resulting in a notion of counterfactuality that seems to conflict with the aforementioned theorems, as there is no 'uncertainty' or 'unassertiveness' involved in expressing $\neg p$.

The supposed falsity of p in subjunctives is, however, not as clear as might seem to be the case. A subjunctive conditional may be interpreted as counterfactual, but it does not have to be, as is illustrated by the example below.[79]

(67) If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. (Anderson, 1951, p. 37)

In supposing a doctor investigating Jones' death utters (67), Anderson (1951, p. 37) argues the 'doctor's statement would probably be taken as lending support to the view that Jones took arsenic – it would certainly not be held to imply that Jones did not take arsenic'. From this, he concludes that the falsity of the antecedent cannot be inferred from a 'true subjunctive conditional in the past (or any) tense'. As Arregui (2007, p. 225) argues, in such examples we 'reason "as detectives": we work our way backwards from the known consequence (in the consequent), to the cause (in the antecedent)'.[80] Huddleston and Pullum (2002, p. 749) too argue that 'the strategy here, then, is to reconstruct what happened by working back from consequences to their causes'. Contrary to indicative conditionals, which mark compatibility with the worlds selected, subjunctive marking places the antecedent further away from the set of

[78]This is not to say that mental spaces are similar to possible worlds. Possible worlds are state descriptions including all the conditions on which the truth value of a proposition depends (Löbner, 2002, p. 237), whereas mental spaces are a cognitive structure that map onto other cognitive structures. In Lakoff and Sweetser's words (see Fauconnier, 1994, p. ix), possible worlds are 'objectivist models, models of the actual world [...] not models of the human mind, but models of the world as it is assumed to be or might be'. For further discussion on possible worlds and mental models, such as mental spaces, see Johnson-Laird (1986, pp. 63–64).

[79]See also Tellings (2016) on the use of subjunctive conditionals in discourse and insights into the requirements for both the licensing and cancellation of their counterfactual implicatures.

[80]Remark that this explanation is only applicable to subjunctives with a true consequence. Subjunctives with false consequents project their falsity onto the antecedent, because in a true conditional, a false consequent cannot have a true antecedent (see the truth table, lines 3 and 4).

readily compatible worlds in order to create epistemic distance (see Langacker, 1978, and for a recent overview and discussion, see von Prince, 2019), without necessarily licensing a *contrary-to-fact* or counterfactual interpretation. In the current analysis of counterfactuality as a conversational implicature, instead of a conventional implicature, this poses no fundamental problems, although the conversational implicature of counterfactuality may be said to be strongly generalised and not easily cancellable. Cancellability can can be observed in other non-counterfactual subjunctives too, such as in the example by Comrie below.

(68) If the butler had done it, we would have found just the clues that we did in fact find. (Comrie, 1986, p. 90)

Here, the characterisation 'reasoning as detectives' is, even in a non-figurative way, of direct use to the current analysis. Suppose a detective utters (68). One can think of a context in which the detective has, until now, not suspected the butler. She is then confronted with the clues spoken of in the consequent. The detective presents the antecedent as contrary not to the truth or to her belief, but contrary to her expectations. This can also be seen in (69), which Karttunen and Peters use to argue that it 'would be incorrect to postulate a general rule that a subjunctive conditional sentence presupposes that its antecedent clause is false'.

(69) If Mary were allergic to penicillin, she would have exactly the symptoms she is showing. (Karttunen & Peters, 1979a, pp. 5–6)

As mentioned in the previous section, we need to look into some detail into the notion of presupposition to follow Karttunen and Peters's argument. Although Stalnaker (2002, p. 712) argues that there is no *general accepted* definition of *presupposition* – there are only 'standard paradigm examples ("the king of France is wise" presupposes that France has a unique king, "John does not regret voting for Nader" presupposes that John voted for Nader [...])' and 'some rough criteria. For example, if sentence S presupposes that ϕ, then the negation of S also presupposes that ϕ' – I will address the notion of presupposition here, because it is important for the argument that subjunctive conditionals do not form a problem for the unassertiveness of conditionals.[81] Presuppositions are mostly seen as those propositions that must be true in order for a sentence to be able to receive a truth value (see e.g., Stalnaker, 1974). In some pragmatic accounts, presuppositions are analysed in terms of common ground, i.e., those propositions that are taken for granted by the participants of the conversation,

[81] This means that I will not go into detail into the different ways of analysing presuppositions. The notion is heavily debated (see e.g., Kempson (1975) and Karttunen (2016), Geurts (2017) for recent overviews and discussion), not in the least because 'the' phenomenon of presupposition is argued to be highly heterogeneous. See Kapsner (2020) for an analysis of presuppositions of conditionals.

or, in Stalnaker's (2002, p. 704) terms, 'the mutually recognized shared information in a situation in which an act of trying to communicate takes place'.[82] A more technical definition of common ground given is the following:

> It is common ground that ϕ in a group if all members accept (for the purpose of the conversation) that ϕ and all believe that all accept that ϕ and all believe that all believe that all accept that ϕ etc. (Stalnaker, 2002, p. 716)

In this sense, a subjunctive conditional would, if one believes it to be counterfactual by nature, accommodate a presupposition of counterfactuality, i.e., it would facilitate the process of adding the falsity of the proposition antecedent to the common ground, in much the same way as with classic examples like 'the King of France is bald' (see Russell, 1905, p. 483). In the same vein, after the subjunctive conditional is uttered, the counterfactual status of the antecedent is added to the common ground. I will follow Karttunen and Peters (1979a) in arguing against a presuppositional analysis of counterfactuals. Karttunen and Peters argue that the counterfactual inference in (69) is a particularised conversational implicature, as they are 'highly context dependent' (an assessment I will challenge shortly below), by showing that they can be cancelled, as in their example in (70).

(70) If Mary were allergic to penicillin, she would have exactly the symptoms she is showing. But we know that she is not allergic to penicillin. (Karttunen & Peters, 1979a, p. 8)

As can be seen in this example, the counterfactual reading may be cancelled by the contents of the consequent and thus it cannot be a precondition (i.e., a presupposition) for the truth value of the antecedent. In the more general notion of common ground, it may be the case that in the majority of situations subjunctive conditionals are counterfactual, but this, in itself, does not make it part of the semantics of the subjunctive. As Huddleston and Pullum (2002, p. 749) argue (see also section 3.2.9), counterfactuality in conditionals is an implicature. A subjunctive conditional in which the 'contrary to fact' implicature is cancelled is 'not common but nevertheless clearly established' and therefore they argue *counterfactual* to be the wrong term for remote (or subjunctive) conditionals. As we will see in later chapters (especially in section 5.4), we will see that the 'contrary to fact' implicature is the default for subjunctive conditionals, and cases in which this implicature is cancelled, as in (70), are highly infrequent. Therefore, the implicature should be considered not 'highly context dependent' (i.e., a particularised conversational implicature, as suggested by Karttunen and Peters, 1979a), but a generalised conversational implicature.

[82] See Stalnaker's footnote for the attribution of the term *common ground* to Grice: 'I believe that the expression "common ground", as a term for the presumed background information shared by participants in a conversation has its origin in Paul Grice's William James lectures. He did not define or explain the term in the published text, but described certain propositions as having "common ground status". See Grice (1989, pp. 65, 274).

According to Mauck and Portner (2006, p. 1333) the implicature of the falsity of p carries over to q in the consequent as a result not of logical necessity, but of the Gricean maxims of Relation and Quantity. The antecedents of subjunctive conditionals as (67) to (68) do not presuppose falsity, but implicate it through epistemic distancing, because *if* is the 'scalar runner-up' to its assertive (factive) pendant *since* (see previous sections). If the antecedent of (67) is taken to *presuppose* the falsity of p ('Jones has taken arsenic'), it should not be cancellable easily – which was already shown to be false by Karttunen and Peters. If it was not cancellable but part of the meaning of a subjunctive conditional, it should be possible to substitute *if* for *since* and result in the same behaviour. As can be seen in (71) below, this is not the case.

(71) # Since Jones has not taken arsenic, he {would have shown/shows} just exactly those symptoms which he does in fact show.

The utterance in (67) may be seen as expressing a chain of inference backwards from symptoms to a non-expected, but apparent cause. While the antecedent is presented as something unlikely or unexpected, the consequent expresses a proposition that is incompatible with falsity of the antecedent, but compatible with the unassertiveness of what is expressed in the antecedent. This chain of inference is not possible in (71), as the antecedent asserts rather than implicates $\neg p$. This shows that the problematic theorems in (20a) and (20b) do not adequately describe uses of *if* in natural language. In case a speaker wishes to assert $\neg p$, no conditional will be used, as it would conflict with the conventional meaning of unassertiveness of conditionals.

To make matters clear, I consider counterfactuality to be a generalised conversational implicature of subjunctive conditionals, as contrasted with indicative conditionals which lack this implicature, as can be seen by contrasting (45) (repeated below) with (72).

(45) If the cat returns before dinner, we don't have to look for it tonight.
$\widehat{\approx}$ p is not asserted.
$\mathrm{Qn}_1+>$ 'The cat may or may not return.'

(72) If the cat would have returned before dinner, we wouldn't have had to look for it.
$\widehat{\approx}$ p is not asserted.
$\mathrm{M}+>$ 'It is contrary to expectation that the cat has returned.'

In the latter example, the modal *will* and verb tense and are used as a linguistic clues for 'epistemic distancing' (Langacker, 2008, p. 302), and because it concerns the past, marked by the past perfective, it licenses a 'counterfactual to the past' implicature. This epistemic distancing can also be seen in (73), which, however, does not concern the past and, as a result, remains epistemically distanced, but does not license a true counterfactual implicature.

(73) If the cat would return before dinner, we wouldn't have to look for it tonight.
$\widehat{\approx}$ p is not asserted.
M‹+> It is contrary to expectation that the cat will return.'

Although we can explain this through Grice's maxim of Manner, Levinson's 'Principle of Manner' in (74) below is better suited, as it explicitly includes markedness.

(74) Levinson's M-Principle

1. Speaker's maxim
   Indicate an abnormal, nonstereotypical situation by using marked expressions that contrast with those you would use to describe the corresponding normal, stereotypical situation.
2. Recipient's corollary
   What is said in an abnormal way indicates an abnormal situation, or marked messages indicate marked situations [...]. (Levinson, 2000, p. 136)

The relation to Grice's maxim of Manner in (29) is that marked forms in Levinson's principle above include those forms which are 'more morphologically complex and less lexicalized, more prolix or periphrastic, less frequent or usual, and less neutral in register' than 'unmarked forms'. The 'layer of additional past' (see also the notion of 'fake tense' in the discussion above) is needed in subjunctives, as modern English has no subjunctive mood (i.e., no 'inflectional expression' that corresponds to modality as a conceptual domain cf. Bybee, Perkins and Pagliuca, 1994, p. 181). Such formal markedness licenses 'additional meaning or connotation absent from the corresponding unmarked forms'. In Haiman's (1985, p. 147) terms, 'morphological markedness corresponds to semantic markedness'. Applied to conditionals, past tense in subjunctives implicates epistemic distance or disbelief, rather than asserting falsity. Dancygier and Sweetser (2005, p. 76) argue along the same lines: 'The main function of the verb forms used in so-called counterfactual sentences is marking distance: temporal, epistemic, or both'.

Compatible with the general unassertiveness of conditionals, subjunctive marking in conditionals implicates, but does not assert disbelief. Counterfactuality as implicature is thus compatible with unassertiveness as a non-truth-conditional meaning aspect. As with indicatives, *if* in subjunctive conditionals invites the addressee to consider the situation in the antecedent and its consequence, without asserting either p or $\neg p$. The contrary-to-fact meaning of a subjunctive conditional is a generalised conversational implicature and while this means it is a default implicature, it is still cancellable. Recent experimental results by Espino, Byrne and Johnson-Laird (2020) corroborate this view. Their results show how subjunctive conditionals, as in (75) below, receive what they call a 'prefactual interpretation', leaving open the truth of p in the antecedent.

(75) If he were injured tomorrow, which he can be, then he would take some leave. (Espino, Byrne & Johnson-Laird, 2020, p. 1275)

The first prefactual paraphrase available is one of possibility: 'it is possible, and remains so, that he is injured tomorrow, and in that case, it is certain that he takes some leave'. When context licenses a counterfactual implicature, the preferred interpretation of their participants shifted to the paraphrase 'it was once possible, but does not remain so, that he was injured'. Another recent experimental study by Skovgaard-Olsen and Collins (2021) shows that the implicated falsity of the antecedent of subjunctive conditionals is 'as cancellable as scalar implicatures', which are uncontroversial cases of conversational implicature. Such experiments notwithstanding, counterfactuals, like conditionals, remain a much debated phenomenon, and in this section, I aimed only at reconciling counterfactuals with the unassertiveness of conditionals.[83]

2.5.5 Conclusion

From the discussions in sections 2.5.3 and 2.5.4 above, I conclude that the unassertiveness of conditionals renders one part of the paradoxes identified irrelevant. In conversation, speakers do not use conditionals to assert p, although they can use conditionals in situations in which p is contextually given, or, on the opposite, believed to be false. The unassertiveness of conditionals itself, however, cannot be a conversational implicature, as the scale on which the implicature of uncertainty, or hypotheticality would be based, is based itself on the conventional, albeit non-truth-conditional, meaning of *if*. Without this unassertiveness, there would be nothing to suggest that *if* is less informative than *since*.

A speaker uses a conditional not because she is necessarily uncertain on the truth value of proposition p, but because she cannot or does not want to assert p.[84] This may be due to uncertainty, but a conditional can also be used for the expression of indirect knowledge, hypotheticality, contrast to expectations, disbelief or another stance towards p. These specific stances are conversational implicatures, albeit, especially in the case of subjunctive conditionals, strongly generalised conversational implicatures. Whereas these more specific stances towards p are conversationally derived from the fact *that* a conditional was uttered (i.e., why did the speaker use a conditional), unassertiveness, i.e., the inability to assert the individual propositions of a conditional, remains constant and is tied to *what* was uttered (i.e., the speaker did not make an assertion of p and q). I will consider unassertiveness a conventional meaning aspect of

[83] For an introduction to the semantics of counterfactuals, see Egre and Cozic (2016), for a recent overview of analyses of counterfactuals, see Arregui (2020). See also Kempson (1975, pp. 218–221) and especially Ippolito (2003, pp. 176–178) for Gricean analyses of counterfactuals.

[84] For another, recent analysis of conditionals in terms of unassertability, see Kapsner (2020). Note, however, that this analysis has different assumptions and posits different analyses in terms of presuppositions for indicatives and subjunctives.

conditionals, because by using a conditional, the speaker signals that she does not commit to the assertion of p, while having reasons to express p in connection to q. This 'connectedness' relates to the second set of problems identified in section 2.3.3, and it is what we will turn to next.

2.6 Connectedness in conditionals

2.6.1 Introduction

The second set of problems identified in section 2.3.3 arose from the lack of connection between propositions p and q in truth-conditional analyses of conditionals. Often, this problem is viewed with respect to line 1 in the truth table for conditionals (see Table 2.1 on page 29), as in Sweetser's example below, but the problem is not limited to this line. Without a connection between the antecedent and consequent, any combination of propositions except a true p and a false q renders the conditional true as a whole. This means that an incoherent example like (23) repeated below is valid despite its incoherence.

(23) If Paris is the capital of France, (then) two is an even number. (Sweetser, 1990, p. 113)

The aim of this section is to provide a clarification of the concepts of 'connectedness' and 'connection'. First, I will discuss the general concept of connectedness in conditionals in section 2.6.2, after which, in section 2.6.3, I will review analyses which consider the connection a conversational, thus cancellable implicature. Then, in section 2.6.4, I argue for another view, in which connectedness is part of the conventional meaning of conditionals. In section 2.6.5, I discuss the related phenomenon of 'conditional perfection', after which, in 2.6.6, I will present an intermediate conclusion on this issue, before moving on to the final formulation of research questions in section 2.7, the conclusion to this chapter in section 2.8.

2.6.2 Connection between antecedent and consequent

In contrast to logical and philosophical accounts of conditionals, linguistic studies of the connection between p and q have been concerned mostly with what kinds or types of connections may be expressed by using a conditional, and less with its actual semantic or pragmatic status. Many accounts assume or posit the existence of a connection between antecedent and consequent, without arguing what it is exactly, and, if not semantic, how it is licensed. For example, Athanasiadou and Dirven (1996, p. 611) mention that conditionals express 'a relationship between a first event and a second event', but the notion 'relationship' is not elaborated. Sweetser (1990, pp. 113–114) is more explicit in stating that natural language conditionals assume 'a *connection* between the truth of the antecedent and the truth of the consequent', but she does not explain what licenses such a connection. Declerck and Reed (2001, p. 46) argue

for a 'link between P and Q' and suggest types of links (see next chapter), but offer no definition. The same can be seen in Saeed's (2011) discussion of the clausal implicature we discussed in section 2.5. In discussing (76) below, Saeed argues that the speaker, 'by excluding the stronger, implicates: "Maybe he's here; maybe not; *therefore* [emphasis added] maybe he can play; maybe not"'.

(76) If he's here, he can play. (Saeed, 2011, p. 472)

The use of *therefore* is not motivated, however, although it refers to the notion of connection under discussion.

If, for the moment, we accept that conditionals express a connection between antecedent and consequent, the type of connection in natural language conditionals may vary. A relatively early and clear set of examples is provided by Noordman, adapted in (77) and (78) below.

(77) If John is ill, he is not going to his work. (Noordman, 1979, p. 85)

(78) If John is not going to his work, he is ill. (Noordman, 1979, p. 85)

It is clear that the conditional in (77) expresses that John's possible illness would cause him to stay home from work, whereas in (78), the assumption that John is not going to his work functions as an argument for the conclusion that he is ill. Therefore, it may be said that the specific connection is contextually determined and pragmatic in nature. Many accounts of conditionals therefore phrase the connection between the antecedent and consequent more generally in terms of 'sufficiency', 'contingency' or 'enablement', because the connection depends on information beyond individual propositions, such as grammatical form, world knowledge and context. Consequently, logicians and linguists such as Strawson (1952), Stalnaker (1968), Grice (1989), Geis and Zwicky (1971) and Lewis (1976) have treated the connection between antecedent and consequent as 'a problem of pragmatics rather than grammar' (cf. Akatsuka, 1986, p. 335; see also references therein; see Kment, 2020 for a recent overview and discussion of causality in counterfactuals).

The opposing view is that the connection is a part of the semantics of conditionals. Mauri and van der Auwera (2012, p. 395) argue, following van der Auwera (1986) and Sweetser (1990), that '*if* is not translatable into truth tables, but rather encodes non-truth-conditional relations such as causal and consequential ones'. They argue that an example such as (79) below, 'semantically encodes that the president's resignation is the cause for the vice president to assume the presidency'.

(79) If the President resigns, the Vice President shall immediately assume the presidency. (Mauri & van der Auwera, 2012, p. 395)

This view is based on van der Auwera's (1986) 'sufficiency hypothesis', in which the antecedent of a conditional presents a sufficient condition for the consequent. Mauri and van der Auwera (2012) argue that there are two types of

analysis of the connection: the truth-conditional analysis in which the connection is not part of the semantics of conditionals, and the non-truth-conditional analysis in which the connection is part of the semantics of conditionals.

I will opt for an account similar to Akatsuka's (1986, p. 335), who argues that the connection is 'an integral part of the "if p, q" construction's linguistic meaning'. She continues by saying that 'each conditional sentence shares an abstract, grammatical meaning similar to 'correlation/correspondence between p and q'. The 'specific nature' of the connection in this view is contextually determined. Akatsuka however, opposes her view with those of the aforementioned scholars who frame the connection as 'a problem of pragmatics rather than grammar', which I do not endorse, as there seems to be a middle ground. I will work out the details of this middle ground in the same terms as the unassertiveness of conditionals discussed in the previous section, and I will argue that a general connection is part of the conventional non-truth-conditional meaning of conditionals, and not a defeasible implicature. Connecting clauses is, after all, the conventional meaning of any conjunction (see e.g., Sanders & Sweetser, 2009; Pander Maat & Sanders, 2006, p. 248).

2.6.3 Connectedness as defeasible non-truth-conditional meaning

As we saw throughout this chapter, the delimitation of semantics and pragmatics is a much debated topic for many linguistic phenomena (for an overview, see, Ariel, 2010), and conditionals are by no means an exception. The previous section raised the question of the status of the connection between antecedents and consequents. We will start by discussing 'connectedness' as a defeasible part of the meaning of conditionals, which is a view defended by, amongst others, Grice.

Grice (1989, pp. 62, 77) considers what he calls the 'Indirectness Condition' a non-conventional (i.e., conversational) implicature.[85] The indirectness condition follows from the non-commutivity of $\supset$, a conventional meaning of 'if', as follows. A speaker uses a conditional form not only when 'the truth-table requirements are satisfied but also some strong connection holds' (Grice, 1989, p. 77). The reason for this specific implicature is, according to Grice, that *if* in propositional logic is the only non-commutative operator, as can be seen in the replacement rules in (80) below (see Magnus, 2015, pp. 119–120, 159).

(80) Replacement rules of commutivity

a. $(P \wedge Q) \leftrightarrow (Q \wedge P)$
b. $(P \vee Q) \leftrightarrow (Q \vee P)$
c. $(P \leftrightarrow Q) \leftrightarrow (Q \leftrightarrow P)$

[85]The term 'Indirectness Condition' was chosen 'presumably because it indicates the existence of indirect evidence of a non-truth-functional nature for accepting an ordinary conditional' (Chakraborty, 1997, p. 550).

These replacement rules include all but one of the binary operators, namely the conditional operator $\supset$, because '$p \supset q$' is not equivalent to '$q \supset p$'. This can be seen when an invalid replacement rule is applied to an ordinary conditional like the example in (81) below.

(81) If it rains, the road is wet. $\not\Rightarrow$ If the road is wet, it rains.

For Grice (1989, pp. 77–78), this is an indication of the existence of a special function for conditionals in natural language, namely to present a 'strong connection between antecedent and consequent'. This implicature concerns the 'presentation of cases in which a passage of thought, or inferential passage, is envisaged from antecedent to consequent' (Grice, 1989, p. 77). This, then, can be used to explain the inconsistencies in theorems (20c) and (20d), because by uttering 'if p, then q', one could have been briefer and more informative by asserting q. There must, therefore, be a reason for the weaker claim (see previous section) and the uttering of not only the consequent, but also the antecedent. Furthermore, it explains why in both sets of Strawson's theorems, valid but incoherent evaluations can be obtained with respect to natural language conditionals. The use of a conditional implicates, on basis of its non-commutivity, a (strong) connection between p and q (see Grice, 1989, p. 78).

For Grice, the connection is a conversational implicature. Before going into the cancellability of this connection, we will go beyond Grice's own analysis and see how we can account for this implicature in terms of calculability.[86] Of all logical connectives, Grice (1989, p. 72) argues, '"if" seems to be the only one which is non-commutative; the order of the clauses of a conditional is not, from the semantic point of view, a matter of indifference'. Following the fourth submaxim of Manner ('be orderly') (see the maxims on page 42), a speaker may be expected to present the clauses of a conditional in the order in which the situations expressed occurred or will occur. In line with Levinson's 'Principle of Informativeness', this can be related to iconicity, because an unmarked expression is most informative by assuming its stereotypical meaning. The stronger inference drawn from 'if p, q' is that, by stereotypical iconic presentation, p precedes q. Add to this the maxim of Relation ('be relevant') and one can make an inference from the temporal relation between antecedent and consequent to a causal connection, which, although in dialectic terms it amounts to the fallacy 'post hoc ergo propter hoc' ('This *after* that, thus this *because of* that'.), is recognised as the conventionalisation of an implicature for various connectives (Hopper & Traugott, 2003, pp. 80–82; Mauri & van der Auwera, 2012, p. 380). This can be demonstrated for the connectives *since*, *after* and the conjunction *and* in the examples in (82) to (83), which may be interpreted in both a temporal and a causal fashion.

(82) Since Susan left him, John has been very miserable. (Hopper & Traugott, 2003, p. 81)

[86] To my knowledge, Grice does not offer such an explanation and, as we will see below, it is not entirely clear whether or not this analysis is in line with Grice's idea's on the scope of the conversational maxims.

(83) After we read your novel we felt greatly inspired. (Hopper & Traugott, 2003, p. 81)

(84) He gave up semantics and felt much happier. (Blakemore & Carston, 1999, p. 1)

As Hopper and Traugott (2003) explain for (83), the implicature 'strengthens informativeness because it enriches the relation between *after we read your novel* and the rest of the utterance, thus providing an interpretation of why the speaker thought it was relevant to include these temporal facts'. As can be seen in (84), this implicature is not only licensed by temporal connectives, but also by *and* (Grice, 1989, p. 28; Blakemore & Carston, 1999, p. 6). Unlike temporal connectives, but comparable to conditionals, however, the conjunction in (84) needs two inferences: one from the iconic order to temporal relation through the maxim of Manner, and a second from this temporal relation to causality through the maxim of Relation, as implemented in (85) and (86) below.

(85) He gave up semantics and felt much happier.
M_4+> 'Giving up semantics preceded feeling much happier.'
R+> 'Giving up semantics caused feeling much happier.'

(86) If it rains, the road is wet.
M_4+> 'Rain precedes the road getting wet.'
R+> 'Rain causes the road to get wet.'

It is, however, not clear whether or not this explanation is in line with Grice's own view on the application of the maxim of Relation, as the maxim is not only described in scarce detail, it is also unclear whether or not it applies only to whole speech acts, or also to parts of speech acts.[87] With respect to conditionals, Skovgaard-Olsen, Singmann and Klauer (2016, p. 29) remark that the maxim of Relation 'applies to the level of whole speech acts, whereas when we talk about relevance in relation to conditionals, we are dealing with an internal relation between the antecedent and the consequent in one sentence'. Douven (2017b, p. 1542) argues along the same lines and argues that it does not follow from the maxim of Relation that so-called 'missing-link' conditionals, in which there is no connection between p and q, appear odd. As I will argue for the conventional (thus not calculable) status of the connectedness in conditionals in the next section, I will not take up this point any further. We will continue,

[87] On the maxim of Relation, Grice merely remarks the following.

> Though the maxim itself is terse, its formulation conceals a number of problems that exercise me a good deal: questions about what different kinds and focuses of relevance there may be, how these shift in the course of a talk exchange, how to allow for the fact that subjects of conversation are legitimately changed, and so on. I find the treatment of such questions exceedingly difficult, and I hope to revert to them in later work. (Grice, 1989, p. 27)

however, by looking at examples in which the connected between antecedent and consequent is apparently lacking or cancelled, which would provide arguments for the analysis above and the conversational status of the implicature.

As remarked before, for Grice, the connection between antecedents and consequents of conditionals is a conversational, thus defeasible implicature, because it is not always present. He provides the example below, in which the connection is, presumably, absent.

(87) If he was surprised, he didn't show it. (Grice, 1989, p. 62)

Grice argues that in cases such as (87), the connection is absent, although he concedes that this is a 'special case', which should be 'satisfactorily explained', as the connection in Grice's view is a generalised conversational, thus default implicature. I do not agree on the absence of a connection in this example, however. In the case of the example in (87), the conditional is concessive. If we combine the unassertiveness conventionally implicated by the use of *if* with the background knowledge that being surprised under normal circumstances causes an expression of surprise, the speaker then uses the connection between surprise and expression to cast doubt on proposition p expressed in the antecedent, which she could not have done were there no connection between being surprised and showing it. This view is in line with the analysis Cohen (1971, p. 62) provides. If we would accept Grice's example in (87) to be a counterexample to the hypothesis that conditionals in natural language always express some kind of connection, and we would accept the 'Conversationalist Hypothesis' that *if* is purely truth-conditional without any conventional implicatures attached, we would have to accept (88), because material implication deems a conditional true in case the consequent is true, irrespective of the truth-value of proposition p in the antecedent.

(88) # If he was not surprised, he didn't show surprise [judgement added]. (Cohen, 1971, p. 62)

Grice provides another example to show that the connection between p and q is a conversational implicature, adapted in (89) below.

(89) ? If you put that bit of sugar in water, it will dissolve, though so far as I know there can be no way of knowing in advance that this will happen [judgement added]. (Grice, 1989, p. 60)

Grice's argument here is that the cancellation here 'has the effect of labelling the initial statement as a pure guess or prophecy'. However, I do not think (89) makes a felicitous utterance, because by uttering a conditional, the speaker commits herself to the connection (which is also apparent by the absence of a modal verb like *may* here). This is in line with an example by Lassiter (in press), who argues that cancelling the connection (or 'relevance effect') between the antecedent and consequent 'leads to a sense of bizarreness'.

(90) # If Mary left the party early, Bill was unhappy – though these things have nothing to do with each other [judgement added]. (Lassiter, in press, p. 4)

In much the same vein as the analysis of unassertiveness in the previous section, the connectedness in a conditional can be exemplified as follows. In the example in (91) below, the conditional conventionally expresses connectedness between the antecedent and consequent, which is then contextually specified into a more specific conversational implicature, which conflicts with the denial of connectedness in (90) (i.e., with 'though these things have nothing to do with each other').

(91) If Mary left the party early, Bill was unhappy.
$\widehat{\approx}$ p is not asserted.
$\widehat{\approx}$ p and q are connected.
$+>$ 'Mary leaving early causes Bill to feel unhappy.'

However, as this could be seen as just 'rephrasing' an intuition in terms of the supposed non-cancellability of the connection implicature, let us look at another example Grice provides, including his rationale, reproduced below.

> There are now some very artificial bridge conventions. My system contains a bid of five no trumps, which is announced to one's opponents on inquiry as meaning "If I have a red king, I also have a black king". It seems clear to me that this conditional is unobjectionable and intelligible, carries no implicature of the Indirectness Condition, and is in fact truth-functional. (Grice, 1989, p. 60)

Grice (1989) argues here that this is an example in which *if* is equivalent to $\supset$ without any implicature of connection between p and q. However, within the specific rules set up in the game, the conditional provides the players with an argument from which to infer that I have a black king in case I indeed do have a red king. So whereas the connection here is not one of clear causality, there still is an inferential link between antecedent and consequent, in the sense that, within this specific context, the knowledge of a player having a red king enables one to conclude that he or she must also have a black king.

Stalnaker's (1968, p. 100) perspective too is illustrative in this matter, as he argues that the connection between p and q is not necessary in natural language. Consequently, it should not have a place in a semantic theory of conditionals.[88] To show that the connection between p and q is not a necessary feature of conditionals, Stalnaker uses the example of a (hypothetical) survey.

[88]It is somewhat strange that Haiman (1978, p. 578) cites Stalnaker (1975, p. 167) as criticising the material-implication analysis as follows: 'it leaves out the idea of CONNECTION which is implicit in an if-then statement', while, both in recent re-issues and in the original 1968 version of the paper, Stalnaker (1968, p. 100) argues as follows: 'The material implication analysis fails, critics have said, because it leaves out the idea of *connection* which is implicit in an if-then statement'. He then continues by arguing that, if this 'were accepted, then we would face the task of clarifying the idea of "connection," but there are counterexamples even

He sets out to answer the question 'How does one evaluate a conditional statement?' and presents the reader with 'a true-false political opinion survey' in which the statement under evaluation is the following.

(92) If the Chinese enter the Vietnam conflict, the United States will use nuclear weapons. (Stalnaker, 1968, p. 101)

In order to evaluate this statement, the following scenario is described.

> Consider the following case: you firmly believe that the use of nuclear weapons by the United States in this war is inevitable because of the arrogance of power, the bellicosity of our president, rising pressure from congressional hawks, or other *domestic* causes. You have no opinion about future Chinese actions, but you do not think they will make much of a difference one way or another to nuclear escalation. (Stalnaker, 1968, p. 101)

Stalnaker, following Ramsey (1950, p. 248), argues that the conditional is evaluated along the following lines.

> Add the antecedent (hypothetically) to your stock of knowledge (or beliefs); and then consider whether or not the consequent is true. Your belief about the conditional should be the same as your hypothetical belief, under this condition, about the consequent. (Stalnaker, 1968, p. 101)

Stalnaker's answer to the question of the evaluation of the conditional in the scenario provided is then: 'Clearly, you believe the opinion survey statement to be true even though you believe the antecedent and consequent to be logically and causally independent of each other'. In other words, in the 'stock of knowledge' of the survey participant, proposition q ('The United States will use nuclear weapons.') is true. This knowledge (or belief) does not change by adding proposition p ('The Chinese (will) enter the Vietnam conflict.') and thus the conditional as a whole is true. Even if one accepts the conclusion derived from this analysis, namely that p is irrelevant in case q is known or believed to be true, the example chosen by Stalnaker may obscure the discussion, as it forces the participant to choose between evaluating the conditional as either true or false, while it may be hypothesised that the participant in the survey may 'simply' find the conditional irrelevant in case she is convinced of the truth

with this notion left as obscure as it is' (see e.g., Stalnaker, 2019, p. 153). Stalnaker (1968, p. 101) concludes that the "connection" is 'sometimes relevant and sometimes not', i.e., it is not necessary, because 'if you believe that a causal or logical connection exists, then you will add the consequent to your stock of beliefs along with the antecedent [...]', but 'if you already believe the consequent (and if you also believe it to be causally independent of the antecedent), then it will remain a part of your stock of beliefs when you add the antecedent'. This means that Stalnaker does not reject the truth-conditional analysis of conditionals in the way Haiman suggests, and that he considers the connection between antecedent and consequent a pragmatic, rather than a semantic (i.e., propositional) matter.

of q. In the following section, I analyse Stalnaker's example in different terms and I will argue for the conventional status of connectedness. Note, however, that, as we have seen in this section that connections can be indirect (see also 3.3.7 for a discussion of concessive conditionals) and are, sometimes, highly context-specific, we need an account of 'connectedness' that is not limited to specific types of connection.

2.6.4 Connectedness as conventional non-truth-conditional meaning

For Grice (1989, p. 62), a speaker using a conditional 'standardly [...] implicates that there is non-truth-conditional evidence when he says that $p \supset q$'. Grice's argument that the non-commutivity of the conditional operator $\rightarrow$ is an indication of the existence of a special function for conditionals in natural language points, I think, towards its conventional status, although Grice is not clear on this, as he focuses mostly on the conversational status of the connections themselves. We have already seen the problems with cancelling connections in the reanalysis of Grice's own examples of conditionals in which he argued the connection to be lacking, and it becomes apparent too when we place Stalnaker's conditional in (92) discussed in the previous section in a more natural conversational context, as in (93) below.

(93) A: I really believe that the use of nuclear weapons by the United States in this war is inevitable.
B: Well, if the Chinese enter the Vietnam conflict, the United States will use nuclear weapons.

a. # A: Yes, that's true.

b. A: No, they will use nuclear weapons in any case.

A's first utterance in (93) is similar to the evaluation in Stalnaker's scenario. B responds by uttering the conditional under evaluation. A's evaluation in (93a) is incoherent, as what seems to be confirmed is not p or q, but the connection between p and q expressed by B, which, in Stalnaker's analysis, is deemed irrelevant by A's original expression of the belief that the use of nuclear weapons is 'inevitable'. This inevitability is not part of the common ground – or shared belief of A and B – as B believes q to be dependent on p.[89] Insightful in this matter is Horn's (1989, pp. 377–379) discussion on metalinguistic negation, in which he gives the following example based on Nietzsche's 'notorious conditional' and argues that it is certainly possible to deny (94) ('It is not the case that if God is dead, everything is permitted.') while not committing to (95).[90]

[89] This characterisation reminds us of presuppositions, which can be understood in terms of background knowledge that is cancellable only using metalinguistic negation. See also section 2.5.4.

[90] Although Nietzsche is believed not to have read Dostoevsky's (1879-1880) *The Brothers Karamazov* (Kaufmann, 2013, p. 318), the novel includes the phrase 'If there is not God, everything is permissible'.

(94) If God is dead, everything is permitted.

(95) God is dead and something is forbidden.

The point made by Horn (1989, p. 378) is that negating a conditional does not amount to negating the material conditional, which would license (95), as can be seen in Table 2.4, in which only line 2 results in $\top$ for '$\neg P \supset Q$'.

Table 2.4:
Truth table of P $\supset$ Q *and* $\neg$*(*P $\supset$ Q*)*

	P	Q	$P \supset Q$	$\neg(P \supset Q)$
1	$\top$	$\top$	$\top$	$\bot$
2	$\top$	$\bot$	$\bot$	$\top$
3	$\bot$	$\top$	$\top$	$\bot$
4	$\bot$	$\bot$	$\top$	$\bot$

Rather than negating the material conditional, the negation of a conditional expresses an 'unwillingness to assert that proposition [the negation of material implication]'. As in Stalnaker's example, the negation seems to target precisely the connection between p and q. Horn provides several examples, but does not analyse them in terms of this connection. Rather, he uses the examples to argue negation being applicable to both truth and assertability. However, when we look at the examples Horn adapts from Grice (1989, p. 81) and Dummett (1973, pp. 328–330), and Horn's (1989, p. 378) explanation below, it seems to be the case the connection between p and q is negated.

(96) It is not the case that if X is given penicillin, he will get better. (Horn, 1989, p. 378)

(97) It is not the case that if X is given penicillin he will get better; it might very well have no effect on him at all. (Horn, 1989, p. 378)

(98) X: If it rains, the match will be cancelled.
Y: That's not so. (or, I don't think that's the case.) (Horn, 1989, p. 378)

According to Horn, Y's contribution in (98) is 'not actually a negation of X's content (presumably a material conditional, although Dummett fails to make this explicit); rather, we can paraphrase Y as having conveyed [(99)] or [(100)]'.

(99) If it rains, the match won't necessarily be cancelled. (Horn, 1989, p. 379)

(100) It may [epistemic] happen that it rains and yet the match is not cancelled. (Horn, 1989, p. 379)

Horn (1989, p. 378) concludes that negation outside the scope of a conditional amounts to refusing the assertion 'if p, (then) q' rather than to a '(descriptive) negation of a conditional whose truth value is determined in accordance with the material equivalence' as presented in (101) below.

(101) $\neg(p \rightarrow q) \leftrightarrow (p \wedge \neg q)$

Given Horn's (1989) focus on negation in *A Natural History of Negation*, this characterisation is suiting, but focusing on conditionals, Grice's original explanation below – within his discussion of conditionals – is more insightful.

> Sometimes a denial of a conditional has the effect of a refusal to assert the conditional in question, characteristically because the denier does not think that there are adequate non-truth-conditional grounds for such an assertion. In such a case, he denies, in effect, what the thesis represents as an implicature of the utterance of the unnegated conditional. For example, to say 'It is not the case that if X is given penicillin, he will get better' might be a way of suggesting that the drug might have no effect on X at all. (Grice, 1989, p. 81)

Two notions are essential here. First, the term 'non-truth-conditional grounds' is used to refer to the connection between p and q in natural language conditionals (see Grice, 1989, p. 62). Second, Grice explains (96) to be a denial of 'what the thesis represents as an implicature of the unnegated conditional', which must be interpreted here as the same non-truth-conditional connection mentioned before. This is in line with Grice's final remark above, namely that it might be a way of suggesting 'that the drug might have no effect on X at all', i.e., the suggestion that no connection holds between taking the drug and and getting better. Negating a conditional thus amounts to denying its conventional meaning of connectedness.

Coming back to the question whether or not a speaker can cancel the alleged implicature of connectedness without appearing incoherent or infelicitous, we can see, in line with the example by Lassiter (in press) in (90) above, that cancellation of the implicature of connection in Stalnaker's example leads to infelicity, as in (102) below.

(102) # If the Chinese enter the Vietnam conflict, the United States will use nuclear weapons, and/although there is no connection between the actions of the Chinese and the United States.

The problematic nature of cancellation of connectedness is consistent with recent experimental work by psychologists, which shows that participants rate cancellation as contradictory significantly more in examples like (102) than cancellation of strongly generalised scalar implicatures, as in 'Some of our guests are in the garden. In fact, they all are' (Skovgaard-Olsen et al., 2019, p. 46).

All of the above points to connectedness being more than 'just' a (generalised) conversational implicature. There have been several analyses that 'a conditional is true [if and only if] there is a valid argument with the conditional's antecedent plus, possibly, contextually indicated background assumptions as its premises and the conditional's consequent as its conclusion' (Douven, 2016, p. 36; see also Kneale & Kneale, 1962, Chapter 3). In recent so-called 'inferentialist' approaches, it has been argued that a conditional is

only true when the consequent follows, through inferential steps (either deductive, inductive or abductive), from the antecedent, in combination with background knowledge, while the consequent cannot follow solely from that background knowledge.[91,92] Furthermore, the antecedent has to be compatible with the background knowledge involved (see Douven, 2016, p. 38 and references therein; see also Krzyżanowska, Wenmackers and Douven, 2014; for recent overviews and discussion, see Skovgaard-Olsen, 2020 and Douven, Elqayam and Krzyżanowska, 2021). In the same inferentialist paradigm, Krzyżanowska, Wenmackers and Douven (2013) and Krzyżanowska, Collins and Hahn (2017, 2020) present experimental results that show how the acceptability of conditionals decreases when a connection is not present (for another recent experimental study, see also Sebben & Ullrich, 2021). Although Krzyżanowska, Collins and Hahn (2017) discuss their results explicitly as an argument against 'a Gricean account' of connectedness, they do not distinguish between different types of implicatures. I interpret 'Gricean' here as Grice's 'Conversationalist Hypothesis' as discussed by Cohen (1971), which seems in line with Krzyżanowska (2019), who argues that the connection between antecedents and consequents fails all tests for conversational implicatures, which in turn is corroborated by experimental results by Skovgaard-Olsen et al. (2019), who show that participants judge cancelling the connection contradictory. In another experiment, Grusdt and Franke (2021) show how the choice to use a conditional to describe a situation is influenced by manipulating 'relevant causal beliefs'.

Other recent approaches to conditionals have argued to include the notion of 'causality' into a more formal semantics of conditionals. Schulz (2011) and Santorio (2019) for instance both argue for a causal notion of entailment.[93] While it goes too far to include such a logic in this discussion, I will discuss the main proposal below, starting with the appropriateness condition in (103) below.

(103) 'If A, then C' is appropriate only if $P(C|A) - P(C|\neg A) = \Delta P^{C}_{A} >> 0$

Here, the 'appropriateness' of conditionals is defined in terms by the probability of the consequent. If this probability does not increase given the antecedent, a conditional is inappropriate (for a detailed discussion of causality and conditional probability in conditionals, see also van Rooij & Schulz, 2019; for

[91] For another framework, 'Hypothetical Inferential Theory' (HIT), which combines insights from both semantic and psychological analyses of conditionals, see Douven et al. (2018, p. 54). The approach adds to the 'the principle of relevant inference', i.e., an inferential relation between antecedents and consequents of conditionals, a second principle, 'the principle of bounded inference', which states that the strength of the relation 'need only be strong enough, in the sense of being subjectively supported', i.e., the relation may be a heuristic, a pragmatic cue or an inference to the best explanation.

[92] See also Crupi and Iacona (2021, pp. 220–221) for an account of 'evidential conditionals' in which 'the evidential support from a [p] to b [q] amounts to the degree of incompatibility between a [p] and ¬b [$\neg q$]'.

[93] For a recent application of Douven's 'missing link' analysis of predictive conditionals to other types, such as concessive conditionals and biscuit conditionals, see van Rooij and Schulz (2020).

an overview of research on the relation between natural language conditionals, causality, and probability judgements, see Over, 2017; Over & Cruz, 2021). This is different from Stalnaker's proposal, which says that a conditional is true in case the antecedent is *not incompatible* with the consequent (see previous section).[94] The definition in (103) effectively means that the 'appropriateness' of conditionals is defined in terms of the difference in probability of the consequent given the antecedent and the negation of the antecedent, i.e., the antecedent stands in a conditional relation to the consequent only if 'manipulating A will change C in a systematic way' (Schulz, 2011, p. 14). Conditionality, in this sense, is defined in terms of manipulation and control (for another account in which weak and strong relevance are formally operationalised, see Dietz, Hölldobler & Pereira, 2015). Tellings (2020) too argues for conditional dependency between antecedents and consequents of conditionals in his analysis of the use of conditionals as answers to questions, as in (104) below.

(104) A: Do you want coffee or tea?
B: If it is freshly made, I would like coffee. (Tellings, 2020, p. 26)

Here, we see a question concerning the consequent (i.e., 'q?'), and an answer in the form of a conditional (i.e., 'if p, q'), in which 'learning about the conditional dependency between p and q is relevant for A in the process of resolving her decision problem "?q",' because the answer enables A to answer the question in terms of p instead of q by means of their dependency.

As in the linguistic literature on the subject at hand, the philosophical literature on conditionals also debates about the status of the connection between p and q in natural language conditionals. Jackson (1998, Chapters 1-4) argues in favour of the so-called 'Supplemented Equivalence Theory' (see also Jackson, 2006, pp. 221–222) in which the truth-conditional analysis of conditionals as material implication is accepted and supplemented with a conventional implicature of connection, in the same vein as I argued in this section, although I argue here for connectedness as conventional meaning instead of a conventional implicature. Jackson (1987) argues that 'there is a convention governing the assertion of (A $\rightarrow$ B) to the effect that it should only be asserted when it would be right to infer B on learning A'. In an earlier account too, Jackson (1979, p. 587) explicitly compares the connection between p and q to other well-known conventional implicatures, such as those connected to *but* as discussed in section 2.4. He argues that 'what is signalled by the assertion of $(P \rightarrow Q)$ amounts to Pr(Q/P) being high. This is sufficient for $Pr(P \supset Q)$', in which the probability of q depends, at least partially, on p, comparable to the probability-based appropriateness account summarised in (103) above. Bennett (2003, Chapter 3), however, provides a number of arguments against treating connectedness as conventional implicature. For instance, words with a conventional meaning licensing a conventional implicature, such as the stock examples *but* and

[94] Note here that this does not mean it necessarily runs counter to Ramsey's proposal, as what some call 'the Ramsey test', is, at least according to Bennett (2003, p. 28), not exactly what 'capture[s] the spirit of Ramsey's remark'.

therefore discussed in section 2.4.3, can be deleted and replaced by a full stop without affecting the truth conditions (Bennett, 2003, pp. 40–41), which cannot be said for *if*. Another objection is that Jackson (1979, p. 93), according to Bennett (2003, pp. 41–42) is unclear by using terms like *tone*, as in 'the words that are responsible for conventional implicatures, that carry tone'. Bennett's arguments mainly concern the nature of and terminology around conventional implicatures and their contribution to an utterance. I will not repeat the rest here, as they falls outside the scope of this dissertation, and furthermore, I think it is impossible to offer an account here that settles this debate. As Levinson (2000, p. 198) repeatedly argues, and this discussion shows again, the difference between what is said, and what is implicated 'is in large part a matter of how the analyst phrases the inferences'. I will therefore take the discussion provided above, including the apparent non-defeasibility of the connectedness and the recent experimental results supporting this view, as arguments for treating the connectedness in conditionals as something stronger than a conversational implicature, namely a non-truth-conditional, conventional (i.e., non-defeasible) part of the meaning of conditional conjunctions in natural language.

How, then, are the more specific connections inferred? As we saw in section 2.6.3, in case connectedness is considered a conversational implicature, it can be calculated using the maxims of Manner and Relation. In this section, however, I argued for connectedness as part of the conventional meaning of conditionals, presenting antecedents and consequents as connected. Conventional meaning is, by nature, not calculable. I argued the *type* of connection, however, to be not conventionally attached to *if*, but conversationally implicated. Several kinds of connection can be expressed using a conditional, and while a full discussion of the types discerned in the literature follows in the next chapter, I will briefly provide examples in the remainder of this section to clarify what is meant by 'filling in the details of connectedness' mentioned in the discussion so far.

Comrie (1986, p. 96) argues that conditionals in natural language combine 'material implication with the *relevance of a causal relation* [emphasis added] from the protasis to the apodosis'. In (105) repeated below, for instance, the connection was presented as being *consequential*, but this cannot be said for Dancygier and Mioduszewska's example in (106), also repeated below, in which, as was discussed in the previous section, q is not presented as a consequence of p, but as a conclusion based on p.

(105) If I catch the train, I will come on time. (Dancygier & Mioduszewska, 1984, p. 122)

(106) If he passed the exam, he must have studied hard. (Dancygier & Mioduszewska, 1984, p. 122)

Clear examples of different types of conditional connections are offered in Sweetser's (1990, pp. 114–119) tripartite classification, as presented below (see section 3.3.7 for a detailed discussion).

(107) If Mary goes, John will go.

(108) If she's divorced, (then) she's been married.

(109) There are biscuits on the sideboard if you want them.

In all three cases, p and q are interpreted not in isolation, but in connection to each other by means of the conventional meaning of connectedness expressed by *if*. The most basic connection in Sweetser's account that of *causality* in (107) and it holds in the 'content domain'; i.e., the 'going' of Mary causes or enables that of John. This connection can also be seen in (105). In (108) the connection is *inferential* and, therefore, less direct, as the antecedent presents an argument for the conclusion drawn in the consequent. This connection is similar to the one in (106). As we can already see, this type of connection lends itself for the expression of epistemic necessity using *must* as in (106), but in (108) we see such a modal marking is not necessary for this connection to be implicated. Finally, in (109) the relation is *pragmatic* and even more indirect, as the antecedent 'merely' expresses a relevance condition for the speech act in the consequent. Sweetser (1990, pp. 141–142) argues the *inferential* and *pragmatic* connections in (108) and (109) to have been pragmatically extended from the causal connection as exemplified in (107). As we will see, there are several accounts which define other types of connections, and, evenly importantly, do so on different grounds. The question we will end with here, however, is on basis of what the exact implicature is inferred. Before addressing this question, and properly formulating the research questions in section 2.8, we will discuss one last issue related to the connectedness in conditionals in the next section, namely the phenomenon of 'conditional perfection'.

2.6.5 Conditional perfection

One argument in favour of the connectedness in conditionals is the phenomenon of 'conditional perfection' (cf. Geis & Zwicky, 1971; Horn, 1972; Gazdar, 1979; van der Auwera, 1997), which takes '$p \rightarrow q$' to conversationally implicate '$\neg p \rightarrow \neg q$', an inference known as the formal fallacy of 'denying the antecedent' (see a.o. Copi, 1973; Gamut, 1991). This means that for the examples discussed before, such as Stalnaker's example on page 81, a 'regular conditional' ('If the Chinese enter the Vietnam conflict, the United States will use nuclear weapons') is 'strengthened' into a biconditional ('Only if the Chinese enter the Vietnam conflict, the United States will use nuclear weapons'). Or, as Sweetser (1990, p. 123) puts it, 'we may, under appropriate conditions, reason from apodosis to protasis, as well as from protasis to apodosis'. We have already seen that it is this interpretation that is denied when negating a conditional. With respect to the denial of 'If the Chinese enter the Vietnam conflict, the United States will use nuclear weapons', this would amount to denying an exclusive relation between the Chinese entering the Vietnam conflict and the United States using nuclear weapons. Sweetser (1990, p. 114) too takes p in the antecedent of an example like (110), Mary's going, as not only a sufficient, but also a necessary condition for John's going.

(110) If Mary goes, John will go. ($p \rightarrow q$)

(111) If Mary does not go, John will not go either. ($\neg p \rightarrow \neg q$)

While the truth table does not predict John's going ($q \vee \neg q$) on the basis of Mary not going ($\neg p$), the implicature licensed by conditional perfection does, by selecting lines 1 and 4 in the truth table and denying the logically valid argument in line 3. This can be seen even more clearly in the classic examples from Geis and Zwicky (1971) in (112) and (113) below.

(112) If John leans out of that window any further, he'll fall. (Geis & Zwicky, 1971, p. 562)

(113) If you mow the lawn, I'll give you five dollars. (Geis & Zwicky, 1971, p. 562)

With respect to the discussed paradoxes of material implication, conditional perfection affects Lewis's (1912, p. 522) 'startling theorems', namely that 'a false proposition implies any proposition' and 'true proposition is implied by any proposition', because the invited inference 'denies' line 3 of the truth table, strengthening conditionality ('*if*, $p \rightarrow q$) into biconditionality or equivalency (*iff*, $p \leftrightarrow q$).

Sweetser (1990, p. 115), following Comrie (1986), argues that the 'if and only if' reading is not part of the semantics of *if*, but a conversational implicature 'which easily follows from the sufficient-conditionality use of *if*'.[95] The question then is whether or not the truth conditions are affected. Intuitively, this seems to be the case, as conditional perfection indeed excludes line 3 from the truth table of conditionals (a true p and a false q) from the evaluation of a conditional. Knowing that line 2 (a false p and a true q) is the only line that renders a conditional false, the only lines that remain are 1 (a true p and a true q) and 4 (a false p and a false q). However, as with other conversational implicatures, this implicature is context specific and can be cancelled. So in (113), the Relation implicature licenses a causal interpretation and this, in turn, licenses conditional perfection, as the speaker may be *assumed*, on basis of the maxim of Quantity, to have expressed all necessary and sufficient conditions for the consequent in the specific context of the utterance. As this assumption is based on the Cooperative Principle and one of the conversational maxims, however, the implicature can be cancelled, and does not always arise, or is not licensed with the same strength, which can be seen in the example in (114), adapted from (86) above.

(114) If it rains, the road is wet.[96]
$\widehat{\approx}$ p is not asserted.
$+\!>$ 'It may or may not be raining.'

[95] Although it is not mentioned by Sweetser or Comrie, this view is corroborated by earlier experimental evidence, as presented by Noordman (1979, pp. 65–87).

[96] For the purpose of clarity, the conventional meaning ($\widehat{\approx}$) and implicature of unassertiveness ($+\!>$) are also explicitly represented in this example.

$\widehat{\approx}$ p and q are connected.
$M_4+>$ 'Rain precedes the road getting wet.'
R+> 'Rain causes the road to get wet.'
+> 'Only rain causes the road to get wet.'

If one accepts that this example licenses conditional perfection too, it can be cancelled much more easily than in the case of (113), for instance by continuing the utterance with 'but people with garden hoses can get it wet too'. By contrasting (113) with (114), we can see the strength of the implicature depends on the contents of the utterance, i.e. as 'mowing the lawn' and 'receiving five dollars' are connected in (113) as an inducement or promise (see e.g., Fillenbaum, 1986; Ohm and Thompson, 2004; Haigh et al., 2011, and section 1.1), the implicature of conditional perfection appears stronger than in (114), in which the connection is one of more general consequence. Another view on this issue is that conditional perfection is not cancellable and 'intrudes' on truth conditions. In 'intrusive constructions' (Levinson, 2000, p. 198) the truth conditions of a sentence make 'reference to the pragmatic properties of its constituent clauses' (Gazdar, 1979, p. 168; for examples and analysis, see also Wilson, 1975, p. 151). I will view conditional perfection as a conversational implicature in the classic (i.e., 'non-intrusive') sense, because it can be cancelled. Note, however, that the conventional meaning of connectedness is not, and cannot be cancelled. If we take (114), for instance, and we explicitly cancel the 'if and only if' implicature as we have done above ('but people with garden hoses can get it wet too'), the necessity of rain is denied, while it still counts as a sufficient cause of roads getting wet. The connectedness of the conditional is thus maintained.

2.6.6 Conclusion

In this section, we analysed the connectedness in p and q in 'if p, q' as part of the conventional meaning of conditionals in order to explain the inconsistencies in theorems (20c) and (20d) on page 33, which suggest that the truth of p is irrelevant in case q is known to be true. If this were the case, one could have been briefer and more informative by asserting q instead of uttering 'if p, then q'. A speaker using a conditional thus, in accordance with Grice, must have reasons to do so and the reason is to express that 'some strong connection' holds between p and q. Unlike Grice, I argued that the connectedness in conditionals cannot be cancelled, and it considered part of the conventional meaning of conditionals.

A speaker uses a conditional not, or not only to express a material conditional, which amounts to a compositional evaluation of a conditional based on the individual truth values of p and q, but to present two situations in connection. This connectedness may be of causal nature, but can also be of another kind. Whereas these more specific connections between p and q are conversationally derived from the fact *that* p and q were expressed using a conditional, the contents of p and q, the grammatical properties of the conditional and the

utterance in context, the connectedness itself remains constant. Although we have discussed this latter specification in terms of a conversational implicature, the characterisation of their licensing in terms of contents, grammatical properties and context leaves open many questions. We will discuss this issue in great detail in the next chapter.

2.7 Research questions

Before summarising the insights gathered in this chapter, let us take the discussion so far to narrow down the question formulated at the beginning of this chapter: how are conditionals used in natural language? In the introduction in section 2.1, I already remarked that one cannot expect such a general and, as we have seen, heavily debated question to be answered in full. However, starting from the material analysis of conditionals and identifying two main discrepancies between 'if p, (then) q' ($\rightarrow$) and $\supset$, and fleshing out two conventional, non-truth-conditional aspects of meaning to deal with these discrepancies now enables us to determine a more specific research direction.

Analysing both unassertiveness and connectedness as conventional, non-truth-conditional meaning aspects of conditionals means that these aspects are treated here as tied to conditional form(s), and that they have no effect on truth conditional meaning. Although this raises several questions about truth-conditional analyses of conditionals, in view of the current study, the two questions in (115) are of particular interest and will guide the rest of this dissertation.

(115) Main research questions

a. What specific implicatures are licensed through the unassertiveness of and connectedness in conditionals?

b. To what extent do the grammatical features of conditional *if* constructions determine the more specific implicatures?

With respect to (115a), we want to know which specific implicatures are licensed through the unassertiveness and connectedness argued for in this chapter. Implicatures related to unassertiveness are concepts described in the literature such as uncertainty, hypotheticality and counterfactuality. Implicatures related to connectedness are, for instance, causal, epistemic, co-occurrence and speech-act connections between p and q. As we have seen already, the more specific implicatures are, contrary to unassertiveness and connectedness, context-dependent. However, as we will see in the next chapters, the grammatical properties of conditional constructions may also affect these implicatures. Therefore, with respect to (115b), and as mentioned several times throughout this chapter, we should analyse not only the conditional conjunction *if*, but the construction as a whole: the conjunction and the properties of the two clauses it connects. From the perspective of construction grammar, we do not only want to know

which 'meanings' (including implicatures) can be expressed by using a conditional, but we also want to investigate those meanings with respect to formal characteristics, or, the grammar of conditionals. Instead of arguing that *if* has either a very general ('vague') meaning that is further specified by the utterance in context (i.e., the monosemy view), or arguing that *if* has different meanings (i.e., the polysemy view), I will approach the questions above by testing to what extent the more specific interpretations of unassertiveness (cf. (115a)) and connectedness (cf. (115b)) are indeed conversational implicatures, and to what degree they are actually generalised, i.e., triggered by differences in grammatical forms in a network of conditional *if*-constructions.

2.8 Conclusion

In this chapter, after introducing the concept of conditionals in section 2.1, we identified a number of characteristics of conditionals in natural language in section 2.2. Next, we compared the use of conditionals in natural language with their truth-conditional analysis in terms of material implication in section 2.3. This yielded two main discrepancies, or, in other words, two clear aspects in which $\supset$ differs from $\rightarrow$ (i.e., in which the logical operator $\supset$ differs from the linguistic conjunction *if*). After discussing the notion of non-truth-conditional meaning in section 2.4, we analysed the discrepancies mentioned before and identified the main non-truth-conditional aspects of the meaning of conditionals in natural language. By doing so, I hope to have provided the needed terminological clarity concerning the notions 'semantics' and 'pragmatics' with respect to the analysis of conditional constructions. As argued for by Cappelle (2017) 'there is an urgent need for some more theoretical reflection about what kind of pragmatic information should and should not be included in constructions and how, if at all, pragmatics differs from semantics'. Leclercq (2020, p. 226) encourages scholars working within the framework of construction grammar to discuss in more explicit terms the notions of semantics and pragmatics, instead of using broad terms like 'meaning', in order to 'increase its internal coherence and to enhance its overall intelligibility for the wider linguistic community'. He proposes to use two dimensions to do so: first a distinction between semantics and pragmatics can be made by separating 'encoded meanings' from 'contextually inferred meanings' respectively, and second, by separating 'truth-conditional content' from non-truth-conditional content'. In this chapter, I hope to have shown that while these approaches draw the line between semantics and pragmatics differently, they do offer analytic clarity when used explicitly, as the identification of two non-truth-conditional meaning aspect in this chapter shows.

The first non-truth-conditional meaning aspect of conditionals, discussed in section 2.5, is their unassertiveness, that is, they cannot be used to assert p or q. Concepts frequently used in the literature on conditionals, such as uncertainty and counterfactuality, are more specific implicatures triggered by the unassert-

iveness of conditional utterances in context. The second non-truth-conditional aspect of conditionals, discussed in section 2.6, is that they present p and q as connected (i.e., 'connectedness'). As with uncertainty or counterfactuality as conversational implicatures derived in part from the conventional meaning of unassertiveness of conditionals, connectedness is conventionally expressed by using a conditional conjunction, and further specified in context by a conversational implicature of, for instance, causality or epistemic inference. In search of clear terminology, I will explicitly phrase what was discussed in this chapter as follows. First, the conventional, truth-conditional content of conditionals is $\rightarrow$. Second, the conventional, non-truth-conditional meaning of conditionals includes their unassertiveness and connectedness. Third, the non-conventional (i.e., contextual), non-truth-conditional meaning of conditionals includes the specifications of unassertiveness and connectedness.[97]

In section 2.7, I took the general question we started out with in this chapter and broke it down into two more specific research questions. In line with the above, these research questions suggest analysing the meaning and the form of conditionals in unison, taking seriously the point made by Dancygier (1998, p. 5), namely that the meaning of conditionals 'is determined by a number of form-meaning correlations which are construction-specific' and that in an analysis of conditional constructions, we need to investigate how 'its lexical and structural features are mapped onto aspects of interpretation [...]'. By explicitly discussing conditionals in terms of their truth-conditional and non-truth-conditional meaning, and in terms of their conventional and non-conventional (i.e., contextual) meaning, we can now proceed, in the next chapter, to discuss which types of conditionals are distinguished in the literature, and how these types relate to the non-truth-conditional meaning aspects discussed in detail in this chapter. Evenly importantly for the further analysis presented in the dissertation, I will inventory which grammatical features are suggested to be related to different types of conditionals, in order to test to what extent the more specific implicatures of unassertiveness and connectedness are generalised or even conventionalised.

[97] Note that by using the term 'includes' for the conventional, non-truth-conditional content, and the non-conventional, non-truth-conditional content of conditionals I would like to make clear that I do not suggest to have given an exhaustive description of the meaning of conditionals. Note furthermore that, as I argued for in section 2.4, I do not use the concept of explicatures from Relevance Theory in this dissertation, which would amount to non-conventional, truth-conditional content.